FROM THE PUBLISHERS OF STV® MAGAZINE AND ONSAT®

JANUARY 1986

Satellite Retailer

THE ONLY MAGAZINE FOR THE SERIOUS DEALER

Dealer Dilemma

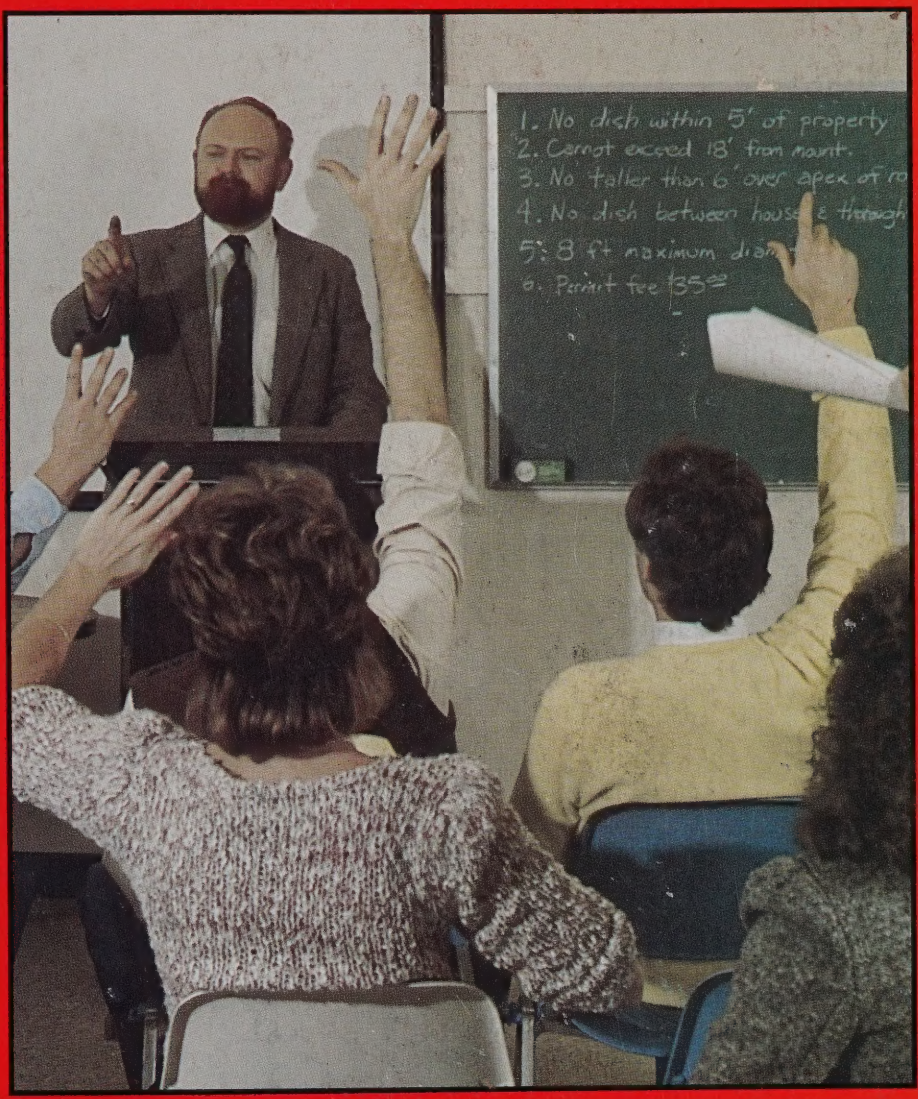
Mobile Showroom

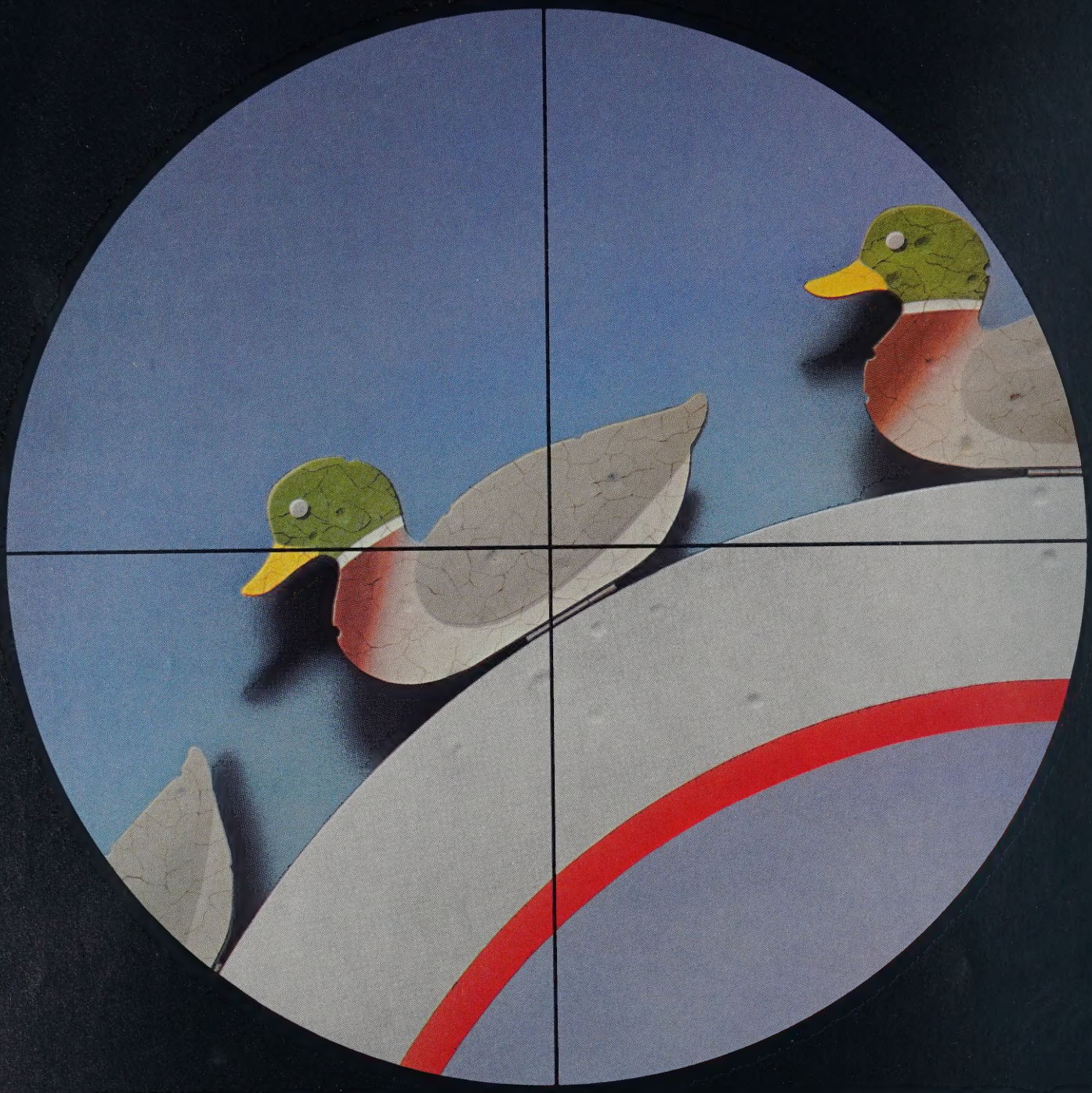
Product Reviews:

Kenwood KSR-1000 Receiver

Uniden UST-7000 Receiver

Focus On: LNBs


1. No dish within 5' of property
2. Cannot exceed 18' from mount.
3. No taller than 6' over apex of ro
4. No dish between house & through
5. 8 ft maximum dia
6. Permit fee $35



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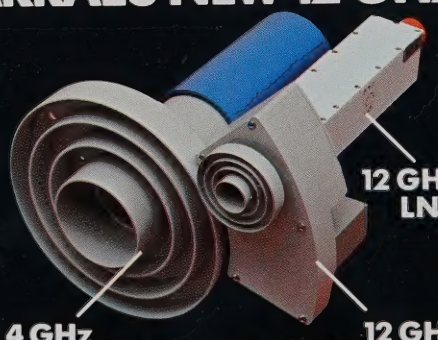

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"I highly recommend . . ." *Richard Sinervo, Satellite Opportunities Magazine, April 1985*

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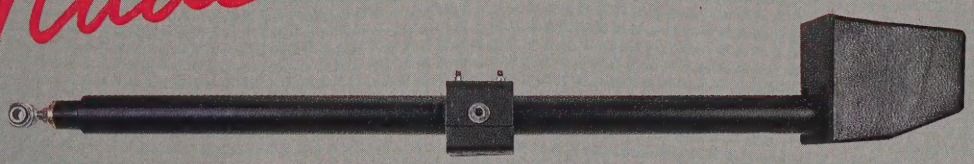
AIMER V*

The Aimer V is Draco's totally new concept in system integration!! This receiver/positioner incorporates a microprocessor controlled digital dish positioner, synthesized stereo tuner, and full function remote control, providing superb performance with ease of operation. Total recall memory provides direct access to any satellite transponder combination, automatically selecting dish position, skew, polarity, audio bandwidth and stereo mode.

Made in the U.S.A.!



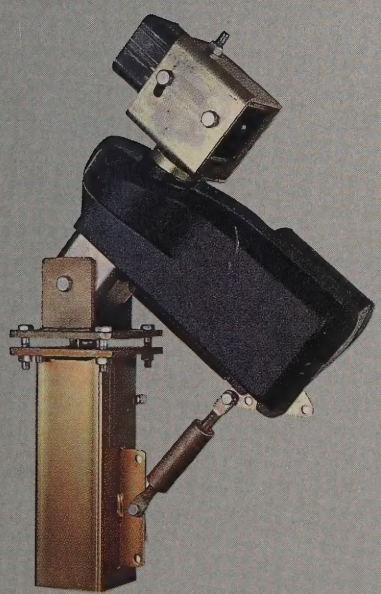
Power Actuators

Draco's 18" and 27" power actuators provide the complete answer to satellite dish movement, polarity, and remote control. These actuators operate at 12 to 36 volts with self-resetting current protection, and rate at over 2,000 pounds. Their superb styling incorporates sealed tubes, solid lubrication, Timken roller bearings, solid steel gears, as well as anti-jamming features. Positively the best Power Actuators built!!

All Draco Aimers include either the 18" or 27" Linear Actuator.

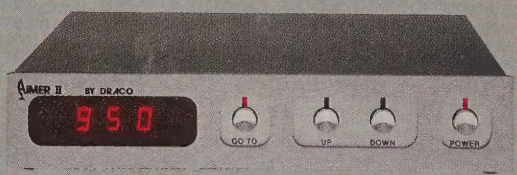
AIMER IV*

This user-friendly, sleekly styled dish positioner features programmable polarity with automatic skew, programmable travel limits, optional receiver interface, and manual or automatic fine tuning capability. The Aimer IV's large display panel enables you to read, select, and change any satellite, all from your easy chair, with the Aimer IV's remote control!



Tru-Align™ Polarmount

The Tru-Align™ motorized polarmount is truly the finest available on the market today. Compatible with most antennas, the Tru-Align™ utilizes the same reliable system as the Draco Linear Actuators. Its infared opto-pulse circuit generates pulses with a minimum amount of noise and interference. If you need horizon to horizon flexibility to zero in on any satellite, the Tru-Align™ polarmount is a must for your motorized antenna positioning.



AIMER II*

With the Aimer II's exclusive fast pass, this dish positioner inputs any satellite location in less than 12 seconds. Push GO TO, and the activator makes one smooth run to the new location. The Aimer II is completely self-contained with its own built in power supply, a must for the discriminating viewer.

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Satellite Retailer™

January 1986
Vol. 1 No. 10

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About Our Cover: Zoning regulations can be positively affected by retailer involvement (see Dealer Dilemma, page 62.) Photo by Scott Moss. Doug Perry poses as retailer.

A Fine Line Between Sanity And Unity

Presently Scrambled

Galaxy 1	Transponder 12	Request Television
	Transponder 16	The Movie Channel
	Transponder 19	Cinemax
	Transponder 23	HBO
Satcom F3R	Transponder 13	HBO
	Transponder 23	Cinemax
Telstar 303	Transponder 21	Telebet Pennsylvania
Westar 5	Transponder 1	New York Racing
	Transponder 15	Pennsylvania Racing
	Transponder 20	Santa Anita Racing
	Transponder 24	Fantasy Channel
Spacenet 1	Transponder 11	Hospital Satellite Network
	Transponder 21	Baptist TV Network
Anik D	Transponder 8	CHCH Houston
	Transponder 9	WDIV Detroit
	Transponder 10	WXYZ Detroit
	Transponder 14	TCTV Montreal
	Transponder 18	CITV Edmonton
	Transponder 21	WTVS Detroit
	Transponder 22	BCTV Vancouver
	Transponder 23	WJBK Detroit

Plan To Scramble

Showtime
The Movie Channel
Christian Broadcast Network
Cable News Network 1
Cable News Network 2
Lifetime
MTV
Nickelodeon
VH-1
Arts & Entertainment
Nashville Network
Black Entertainment Television
ESPN
Disney Channel
WOR
WGN
WTBS
USA Network
CBS

DESPITE THE PROTESTATIONS OF A million home satellite viewers and ten thousand dealers, distributors, and manufacturers, the inevitable is happening now. The question of scrambling is no longer if, it's who and when! A quick tour of the satellite arc will reveal as many as 21 channels presently scrambled.

At the present time, only one of these scrambled services (Fantasy Channel) is available to home satellite viewers in the US. Despite claims from HBO, as of press time we were unable to purchase a VideoCypher II and a subscription to HBO/Cinemax for home use.

Now, let's look at the list of programmers who claim that they will scramble within the next year. There are at least 19 channels that have made some sort of scrambling announcement.

If these programs do indeed scramble we could have as many as 40 scrambled channels on the satellite by the end of 1986. How are we going to handle this situation? What are we going to tell existing owners and potential purchasers of home satellite systems? We can no longer ignore the problem or respond to the question with the flippant response that "there are lots of other programs to watch." Honest and positive answers must be provided to customers who say "I'd like to buy a satellite system, but I'm worried about scrambling."

I would like to end this column with the answers to this dilemma but I can't. I don't have the answers and neither does anyone else. There are too many variables, most of which are beyond our control. Cable companies, programmers, Hollywood, and Congress hold the fate of this industry in their hands. We can and must, however, try to influence the decisions that these power brokers make. The time has come for sanity and unity if we are to take our rightful place in this industry. Someone is going to have to take the lead and mend some fences and we are going to have to learn to work with our adversaries—especially the cable companies.♦

This Business Can Make A Dealer FRANTIC

Filling Orders Quickly
Servicing Products
Keeping Up With New Technology
Advertising Effectively

These are just a few of the everyday demands that can leave dealers with that FRANTIC, WILD-EYED FEELING. Satellite Video Services, the Northeast's leading distributor, understands the problems dealers face and offers immediate solutions. The SVS system of support and service enables dealers to grow as quickly as the fast-paced world of Satellite TV demands.

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The Northeast's Leading Distributor

SECOND TO NONE

#1 with Commitment to the Satellite Industry

#1

At Satellite Video Services we repeatedly assert our commitment to a bright future. We're developing more dynamic marketing programs and discovering new growth areas for dealers. Our research of new products enables us to bring dealers the right products at the right price. Our 2 new locations further these assets and support our major goal—responding consistently to dealers' changing needs.

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Terrestrial Links

by Christopher J. Schultheiss

Gensat Closes Doors—Meridian Technologies, which is a publicly traded Canadian corporation and the owner of Gensat, recently announced that it would close down Gensat due to year-end losses that were in the $4 million range. Former president Sam Singer was putting together a new team as of press time, and planned to continue the initial concept of Gensat's TVRO line and a line of advanced consumer-friendly receivers.

STTI Relocates—This industry's major trade producer has relocated to Las Vegas. Rick and Gloria Schneringer, owners of STTI, have relocated both home and office to the 'Fun Capital' of America. The new address is 4970 S. Arville, Suite 108, Las Vegas, NV 89118.

Rumors of Drake's Demise Exaggerated—A flurry of rumors that Drake was about to close its doors are unfounded. According to a source at the Miamisburg, Ohio, based company, cutbacks in production and employees were the cause of the rumor. Although there is no doubt that Drake's sales and markets have slumped, Drake does not plan to give up without a fight. They will respond to soft market conditions with the introduction of some new products.

Commtek Closes *Sat Guide*—The Boise, Idaho, based publisher has quietly suspended publication of its cable-oriented programming guide. Sat Guide's demise accompanied lay-offs of as many as ten employees. Insiders at Commtek have expressed concern that there may be more lay-offs in response to the publisher's flagging markets and marginal profits.

TeeCom To Go Public—The Montreal based manufacturer of antennas, receivers and LNAs is about to launch a public offering. President Oscar Steiner, having just returned from the Orient, plans to become much more aggressive in the marketplace when the new funding is in place. If all goes well, you can expect to see TeeCom on the Toronto Stock Exchange.

Viewstar To Cease Operations—An official announcement is expected momentarily from the Scarborough, Ontario, based receiver manufacturer. The Viewstar receiver, which had an excellent reputation for video performance, could not compete in the US market primarily because the major distributors declined to carry the relatively high-priced unit. Viewstar will probably have ceased operations by the end of December.

Hytek In Trouble—Hytek, which bought the assets of Dexcel this year, is reportedly in serious trouble. Problems with delivery and performance of several very ambitious products may have caused cash flow problems. Hytek's major suppliers for the monolithic LNA and their smart receiver have been talking to other potential buyers as Hytek seems unable to fulfill its commitments.

M/A-Com Sells To Cable—In Multichannel News, the voice of the cable industry, M/A-Com VP Larry Bowman stated that the company, "has been supplying TVRO systems to both Cox Cable Communications and Heritage Communications for the past six months," adding that, "I don't see a problem with dealers and operators. Dealers are already used to competing." In the same article, Charlie Ergen of Echosphere said, "cable offers a perfect outlet for selling and leasing home satellite equipment," and that Echosphere, "has been selling TVRO systems to cable operators in mostly rural areas for more than a year." Winegard's vice president of marketing used even stronger words, stating, "I hope it's going to be a big business. Cable operators are obvious marketers of the product," and went on to predict that cable operators, "will ultimately become the largest marketers of TVRO equipment." ◆

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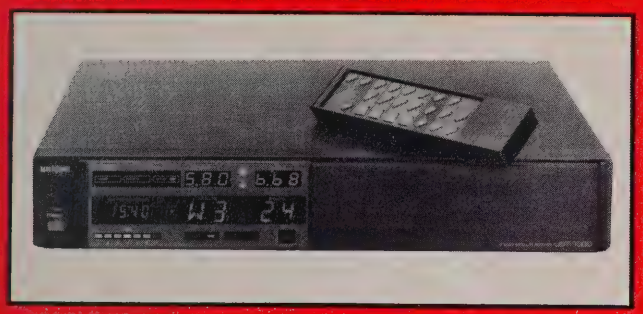
UST 2000 Receiver
A dream come true for first time purchasers. The single conversion UST 2000 enables consumers to explore satellite TV at an affordable price and still enjoy the most frequently used operating features.

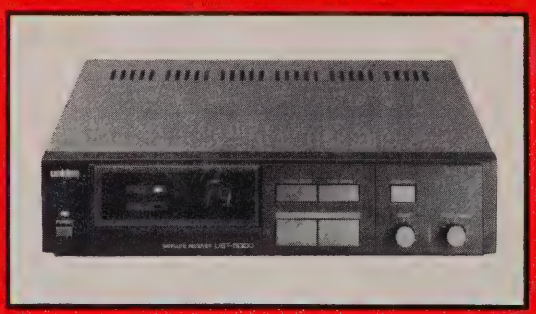


UST 7000 Receiver
Overall excellence in every feature is what makes Uniden's UST 7000 the incomparable leader in block downconversion. Featuring built-in programmable antenna control, easy to read LED displays, stereo sound and much, much more.

UST 6000 Block Receiver
Uniden's popular UST 6000 is the best buy in stereo block downconversion receivers.

Ask a Satellite Video Services sales representative about Uniden package discounts.

UST 5000 Receiver
If you're looking for High Quality at a Low Price (and who isn't?) you've found it with the UST 5000. Combines sophisticated engineering with ultimate simplicity of operation. An ideal choice for a multiple receiver installation.



Experience the perfect complement to Uniden's receivers with UST 710 and UST 730 antenna positioners. Your choices are greater with Uniden—and Satellite Video Services has them all.

Satellite #1 Video Services™

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Generous co-op ad program. Progressive retail financing plans. Sales & marketing seminars.

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Each of our 6 fully-stocked branches are staffed with concerned customer service personnel, knowledgeable Account Representatives and aggressive management to ensure that Satellite Video Services' dealers are #1.

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Letters To The Editor

Dear **Satellite Retailer**,

After reading the November issue of your magazine I found all of the articles to be informative and most of them interesting—save one. "The Return of Indiana Banks" is, in my opinion, quite out of place in the quality publication that Satellite Retailer is.

I realize it is meant to be humorous, but I find it offensive; especially the cheap shot directed at Mike Gustafson, the technical editor of Satellite Retailer. I have read all of the articles by Mr. Gustafson that have appeared in various satellite magazines, and found them to be consistently well done. He's an expert in his field, yet writes his reports and evaluations in a style that enables the information to be understood and useful to the non-technical reader such as I. Now Mr. Banks would like him to be a show biz personality as well! I'll take a low-key, educated individual who knows his field and speaks literate English any day.

A point I think Mr. Banks overlooked: I feel that all the programs evaluated are primarily intended to be educational. I suspect all are being done on low budgets, and I personally find them refreshing. They are a pleasant change from the perfect, error-free, professionally-produced shows.

Sincerely,
Joy Holperin
Eagle River, WI

Your evaluation of "Indiana Banks" is accurate. It is meant to be a humorous and satirical look at this industry and its personalities. When Mike Gustafson read the Bobby Banks article his response was as you might expect—Mike took it all in good humor and agreed that we all needed to be reminded of our mortality once in a while.

Dear **Satellite Retailer**,

I would like to personally take time to write and express my appreciation for the great job you are doing with Satellite Retailer. I find the magazine very informative and up-to-date with articles of a high degree of interest. I find that it's my favorite publication on the satellite business. As president of Sound West, Inc., one of the northwest's oldest and largest electronic chains, sporting a reputation of 15 years in the audio business and 4 years in the satellite business and 1500 dishes in the ground, we find your publication very interesting and a must for all the sales people in our organization, to follow market trends and new products. Keep up the good work.

Thank you,
James Raines
President, Sound West, Inc.
Spokane, WA

Our editors are blushing—thank-you for the very nice compliments. Satellite Retailer is intended to try and get information and educational material for the dealers. We are very concerned about the ability of small dealers to compete in this industry in the face of competition from cable companies and mass merchandisers. We may not be number one but believe me, we try harder!

Dear **Satellite Retailer**,

I could not help but agree with what Mr. James Ashman said in his letter (July) regarding shoddy satellite dealers or so-called dealers. We are cursed with the same problem up north. I had a visit from one of the competition's customers who had just bought a satellite system. He told me that he paid over $3,200 for a system that I could sell with an acceptable profit for under $2,600 (Canadian). That markup is nowhere near what one of Mr. Ashman's competitors charged a customer, but the similarities of circumstances encouraged me to write this letter to voice the same opinion as Mr. Ashman.

The customer also stated that he called several times for service, but never received any kind of service, which is why he came to us in the first place. He was very disappointed to hear that he could have saved over $600 on the exact same system.

Although we don't even come close to the sales of Southwestern Satellite Inc., (Mr. Ashman's dealership), we are proud to be in this business. We have had no complaints, (as a matter of fact, we have had compliments on installations and service) except for the 1% which Mr. Ashman refers to as "never satisfied." I would conjure that these types of people are everywhere.

I am not in business to rip people off. I am here to promote satellite TV and to provide a need to the people of our area. If a customer wants service, he will get it as soon as possible. I will not tell him that he has to wait for a month before I can service his dish. Giving a customer his money's worth and providing prompt, efficient service is my policy. Maybe this industry should survive on word of mouth. That would eventually eliminate these rip-offs.

Yours truly,
Mike Kovacich
President, Kovtek Satellite, Inc.
Port Colborne, Canada

The problem both you and Mr. Ashman outlined is becoming increasingly prevalent and unfortunately as the old saying goes "it only takes one rotten apple to spoil the bushel." There will always be opportunists and quick buck artists who jump into a new industry to take advantage—and there will always be customers who are easy marks for their type of tactics. ♦

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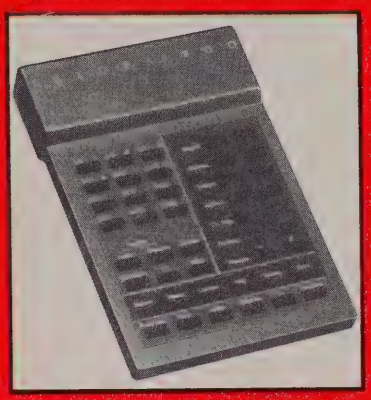
Satellite Video Services

We've Got It All
and We're Bringing It to You
Luxor's new "Intelligent Satellite System," based on the 9900, is truly State of the Art. And now Luxor brings you its new mesh satellite TV antennas to complete this fine system.

Luxor proudly presents its 9' and 10½' mesh dishes. UPS shippable. Easy installation. Baked-on Black Satin finish. 5-yr. warranty.



Luxor 9900 Receiver
The last word in Block Satellite Receivers is here—unparalleled in quality, yet as easy to use an an ordinary TV. The 9900 makes living easy for dealer and customer alike. Factory preprogrammed. Self-diagnostic microprocessor. Built-in programmable TI filter. Discrete parental lock out. The first 4/12 GHZ synthesized satellite receiver.

Luxor 9995
Block Satellite Receiver—your ultimate answer for multiple TV installations. Superbly designed. Built to function as an add-on receiver to Luxor 9900 and Mark 2 receivers, it can also stand alone for 4/12 GHZ reception.

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5 free seminars per month. Basic Installation to Advanced Technical Training. Space Certification Classes.

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Mobile Showroom

Beginning from scratch, Jerry and Diane Neal have worked to make their business thrive.

by Karen Miller Sisk

In Tulsa, at least, two showrooms are definitely better than one!

DO YOU FIND IT DIFFICULT TO appear professional when performing a site survey? You drive up in your car, pull the necessary survey equipment out of your trunk, and drag it across the lawn. Only after this has taken place are you ready to begin your site survey. Watching all this take place, the customer is becoming quite worried. He is probably thinking, "Does this person know what he is doing? Should I purchase my system from him?"

This is a question that a customer of the Satellite Ranch in Tulsa, Oklahoma, never needs to ponder. As a matter of fact, that question would probably never even enter his head. When the Satellite Ranch does site surveys, they drive up in their mobile showroom. Yes folks, you heard it right. They not only have a 2,200 square foot store, they have a mobile showroom.

This is a story of inspiration for those of you whose business is not yet what you dreamed. Jerry and Diane Neal, owners of the Satellite Ranch, started out with no more than the average person. Their story could be yours, with a little work!

Jerry and Diane live 20 miles outside of Tulsa, Oklahoma, in the small town of Bixby. Like millions of other people who live in small rural towns, they had very limited television reception. The Neals purchased a home satellite system to improve their viewing selection. Because of their professions, they quickly saw an opportunity in the TVRO business. Diane has ten years of experience in accounting and management. Jerry has over ten years of experience in upper management, specializing in sales, marketing, and management.

In December of 1983, the Neals started their business. Jerry obtained a list of suppliers and installers from a dealer who had gone out of business. They purchased business cards, an answering machine, and some inventory with $4500 from their savings.

The Neals worked out of their home, as they did not want to overextend themselves. This should serve as encouragement to those of you who are working out of your homes. Jerry and Diane have shown that a business can begin in the home and become very profitable. One point that should be kept in mind: the Neals treated this as a business. It was not a hobby or a fly-by-night scheme to make money. They acted in a professional manner, read up on the industry, and made the necessary monetary investments.

After 18 months of working out of their home, the Neals moved their business into a 2,200 square foot storefront. The showroom has approximately 1,200 square feet, leaving 1,000 square feet for the warehouse. When the Neals made this move, they also extended their sales line to include TVs, VCRs, stereos,and other small electronics. They are promoting their store as the 'total home entertainment center.'

On the showroom floor, there are three dishes on display—two C-bands and one Ku-band. During a good month, the Satellite Ranch sells between 20 and 25 satellite systems. The Neals feel that moving into a store front has increased their sales substantially. Jerry says that the "sales came along with a certain amount of credibility and

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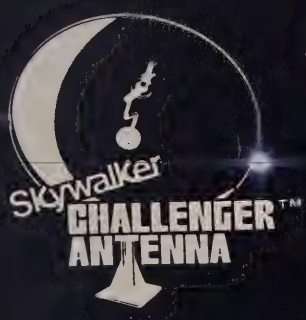

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For "Oklahoma's first dealer with a mobile showroom," every excursion is an advertisement.

a professional image."

While tending the Satellite Ranch's booth at a trade show, Jerry saw a satellite system designed for a motor home. The next week, he purchased a system and a van. After customizing the van and attaching the satellite system to the roof, his business became "Oklahoma's first dealer with a mobile showroom." The mobile showroom allows Jerry and Diane to perform in-home sales, outside promotions, and effectively do site surveys. By using the mobile showroom, Jerry can have his customers watching satellite TV on their own set within five minutes after arriving at their home.

The mobile showroom enables the customer to make a purchase without having to come to the store. Jerry and Diane give the customer the choice of coming into the store or calling in. Regardless of what method they choose, the mobile showroom goes to their home for a site survey. Jerry feels this insures excellent reception.

Probably the most important thing that the mobile showroom has done is to gain recognition for the Satellite Ranch. Jerry estimates that it has increased their business 200 to 300 percent.

The Neals do not rely solely on the mobile showroom for advertisement. They regularly use ads on television and radio. Ads for the Satellite Ranch also run in the newspapers and in mailouts, and the Neals regularly appear at trade shows. Referrals are also part of their advertisement scheme. Giving people excellent and reliable service insures referrals. Every system that Jerry and Diane sell carries a full warranty for one year or more.

At the present time, the Satellite Ranch employs five full-time and two part-time salespeople. Installations are done by two installers who work exclusively for Jerry and Diane. Jerry describes them as being the best he's ever seen.

There is plenty of competition around Tulsa. However, Jerry feels that his biggest competition is from those dealers with low overhead—people operating out of their homes who can sell for lower prices. Being the professional he is, Jerry does not forget his roots. He remembers that he began his business in the same way, so he doesn't let the competition bother him.

The scrambling issue has affected business by making prospective customers more skeptical. Jerry says that once the customer sees what is available via satellite they forget about scrambling. As he points out, most people don't buy a satellite system to receive HBO, anyway.

When asked for any advice they might give to other dealers who are interested in building a successful business, the Neals listed the following points.

You should:

—not expect to get rich quick.
—read everything you can get your hands on that concerns TVROs and the industry.
—attend every show possible.
—join SPACE and other professional organizations.
—take extra time with each customer. This gives him pride in doing business with you.

The Neals' advice should be considered. In 18 months time, they have gone from a tiny business in their home to a profitable business that is growing.

Part of the Neals' success can be attributed to a realistic attitude. They realized that the TVRO industry did not owe them a living. Jerry and Diane knew that if they wanted their own business, it was up to them to earn it. For the past year, they have both worked at least 60 hours a week. You may want to reread that. It says: 'at least 60 hours a week.' Yes, they now have a profitable business and they could sit back and work less hours, but they want their business to have an assured future. There is too much competition out there for anyone to sit back and take it easy. The dealer who is excited about the industry and stays on his toes will be the dealer who survives. ♦

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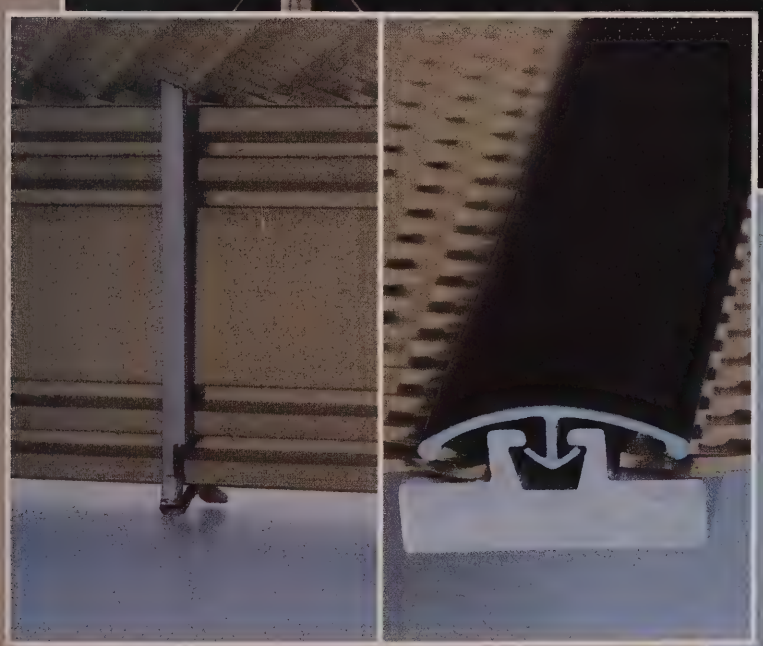

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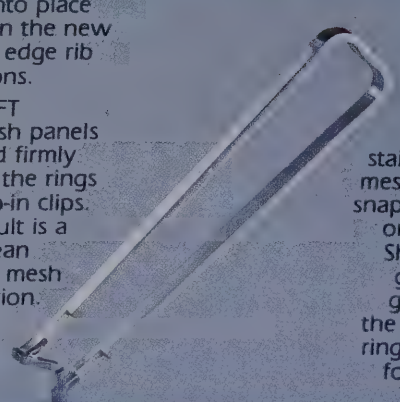

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What Do A Satellite and a Car Dealership Have in Common?

(More than you think)

by Mimi Cook-Hall

"GOOD MORNING, SIR. MAY I interest you and your wife in our latest satellite system? How about this black mesh dish or would you prefer brown, this year's most fashionable color? It comes with stereo and remote control, complete with a 22,300 mile warranty. And the best part is, it was owned by a little old lady who only watched Dr. Scott on Sundays...."

If selling satellite systems was that easy most homeowners would own one by now. As we all know, selling satellite sytems is a horse of a completely different technology. However, the satellite industry has some similarities to the car industry because they are both based on sales and service. They also share similar problems.

Car dealerships sell big ticket items such as cars, trucks, vans, etc. They also have to provide warranty service and operate a profitable service department, not to mention keeping track of overhead expenses while fighting a competitor's low price. Sound familiar? We know these problems all too well.

The biggest difference is they are making money, lots of money, and their bank accounts prove it. Can you claim the same? Well, if you are not comfortably in the black you might look to the car industry for some inspiration. Recently, a friend in the automotive industry gave me the opportunity to diagnose his car dealership in hopes of finding some answers that might apply to the satellite industry. What I found was a difference in accountability.

The most obvious difference between the two types of dealerships is departmental profitability. Car dealerships separate the sales department from the service department. Each department is responsible for showing its own profit as a revenue/cost center. Sales and service have their own accounting numbers and are kept separate on paper. The net profit of each department has to include the cost of salaries and rent space used by the department. This gives the dealership the advantage of tracing lost profits to the specific department which is having a problem. Some car dealerships even have the spare parts department count as a revenue/cost center.

Service

Unfortunately, satellite dealers do not make the same distinction between departments. The sales and service departments operate as one overlapping unit making it tough to keep track of expenses. The cost of a system and its installation is often quoted to the customer as a flat price before costing out the installation. Without differentiating the cost accountability of each part of the sale the actual profits can be severely eroded by the cost of installation. It is not surprising that some dealers are so competitive with their pricing that they are barely making any profit and are quickly getting in debt or going out of business. It is almost impossible to stop a company's financial bleeding unless you can isolate the problem and reduce expenses. The fact of the matter is, if you are not making money on your service department, chances are you are losing money.

A service department can have other sources of revenue besides installations. Car companies have been offering service warranty contracts for a long time. The satellite industry has been slow in offering this type of service to customers. Another good source of revenue is after warranty service. Fine tuning dishes after a storm, repairs and upgrading service can bring in a good monthly income while increasing your cash flow.

Sales

Car dealers approach sales from a slightly different perspective. They depend on return business in the years to come. Theoretically, a young couple might come into the Ford dealership and buy a Ford Fiesta this year. Five years from now the same couple will return and buy a station wagon, and eventually work up the ladder to the more expensive LTD as their needs change in the future. This type of return business will probably depend on how the salesman and the service departments have treated the couple over the years.

On the other hand, some satellite dealers think that once the customer has purchased a satellite system his invoice goes into a file and only gets opened if there is a technical problem. The smart dealers take the opportunity to call each customer every so often to upgrade their system and not let the competition take away their return business. The same practices go for a satellite retailer; good service is essential to keep satisfied customers and get referrals. It also insures that you will have return business in the years to come. ♦

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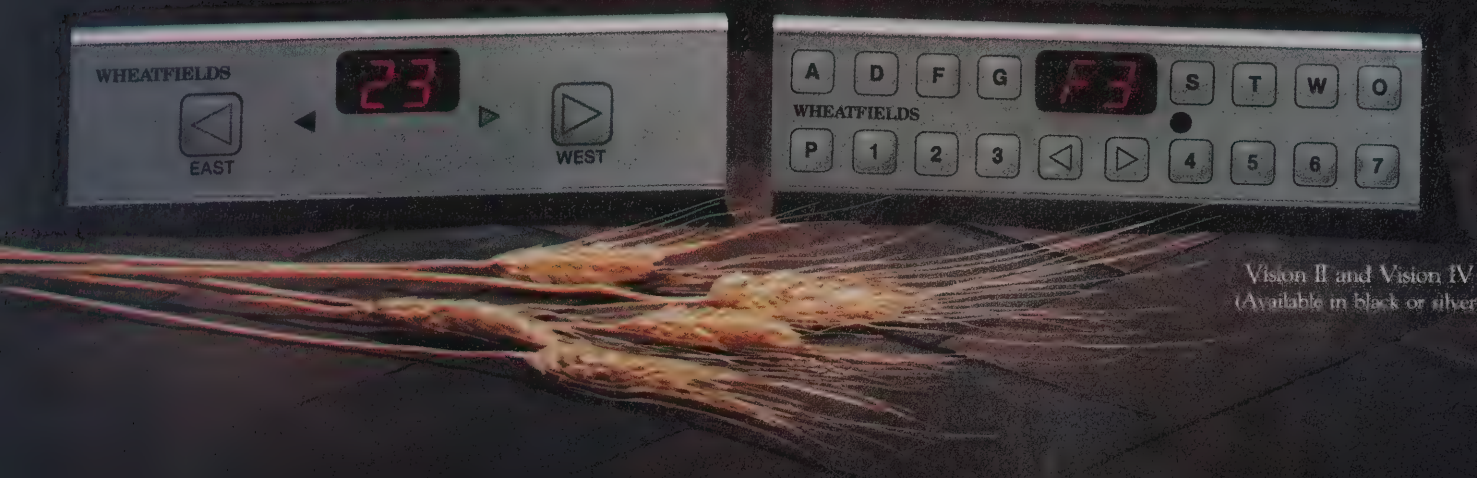

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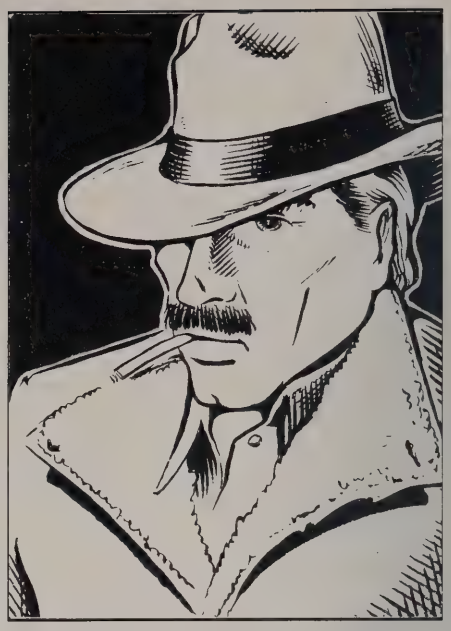

Let's face it, guys, just because somebody has enough money to publish a magazine or produce a television show doesn't mean he knows anything.

by Bobby Banks

THESE SO-CALLED PROFESSIONAL journalists and broadcasters are becoming a royal pain in the you-know-what. When I was a kid, my father used to say "those who can, do— those who can't, teach." I think the same thing can be said for the media types in the home satellite business. They don't have the moxie or the know-how to get in there and design, manufacture, or sell a product—but they sure can moan and groan about how badly everyone else is doing.

Now, don't get me wrong. I have nothing against media types, as long as they know their place. But, based on what I saw at the Nashville SPACE/STTI show, those yahoos have started to believe their own press releases. They really believe that with their "objectivity" they have something to teach all the hard working manufacturers, distributors, and dealers out there in the trenches. Think again, fellas, you're beginning to scare me a little.

Specifically, I am talking about a Press Panel that somehow ended up on the show schedule. According to the grapevine, this fiasco was arranged by The Litchfield Group, the public relations firm for SPACE. As far as I can tell, the intent was to get together a bunch of publishers and broadcasters on the assumption that they could give all us ignorant folks the real scoop on zoning and scrambling and other hot issues. Since none of these people could build or sell a satellite system if their life depended on it, about all they had to offer was an hour of platitudes that the audience had heard a hundred times before.

Let me tell you, this old boy didn't pay his own expenses halfway across the country to listen to a bunch of know-it-alls spew forth a crock of drivel. Let's face it, guys, just because somebody has enough money to publish a magazine or produce a television show doesn't mean he knows anything. All it really means is that he has enough bucks to buy himself a forum to promote himself and his ideas.

They don't have the moxie or the know-how to get in there and design, manufacture, or sell a product—but they sure can moan and groan about how badly everyone else is doing.

Now, here's the bottom line—if I am at home watching Boresight and get disgusted I can turn it off, or if the editorials in STV are particularly stupid, I can chuck the issue in the trash can. But, if I've driven all the way to Tennessee to attend a satellite show, I don't want some Harvard three-piece suiter from a fancy Washington PR firm filling up the schedule with a bunch of media hypes (sorry, media types) who are in love with the sound of their own voices. Frankly, I couldn't care less about their half-baked fortune telling. And, to add insult to injury, it was obvious that nobody on this so-called panel had invested even thirty seconds in preparing their talk. I guess we were supposed to be so dazzled by their wisdom that we would be oblivious to their stumbling delivery.

Since each of these people already has a forum (some more than one), I suggest they feed their egomania on their own time, not on mine. How about leaving the podium to those folks who have demonstrated that they can really do it—not just talk about it.

As long as I am taking a whack at the STTI/SPACE show programs, have you noticed how screwed up the seminar schedule has been over the last three shows? It seems that the rooms where the talks are held are continuously being changed, and the scheduled times are not always as listed in the program guide. What gives? Don't those folks know more than a day in advance who or what is going to be on the program? At the Nashville show they even had the gall to delay opening the display hall two hours so we could listen to some political mumbo jumbo, but what if we didn't want to listen to these guys? Tough, I guess. There were a lot of people wandering around the show who were looking for someone to lynch due to that bad idea.

Oh well, I don't much care if the folks in charge of the shows kill off the seminar program with bad management, it will leave more time for beer drinking and girl watching. See you at the Las Vegas show, if those in charge of the show can manage to find the town. ◆

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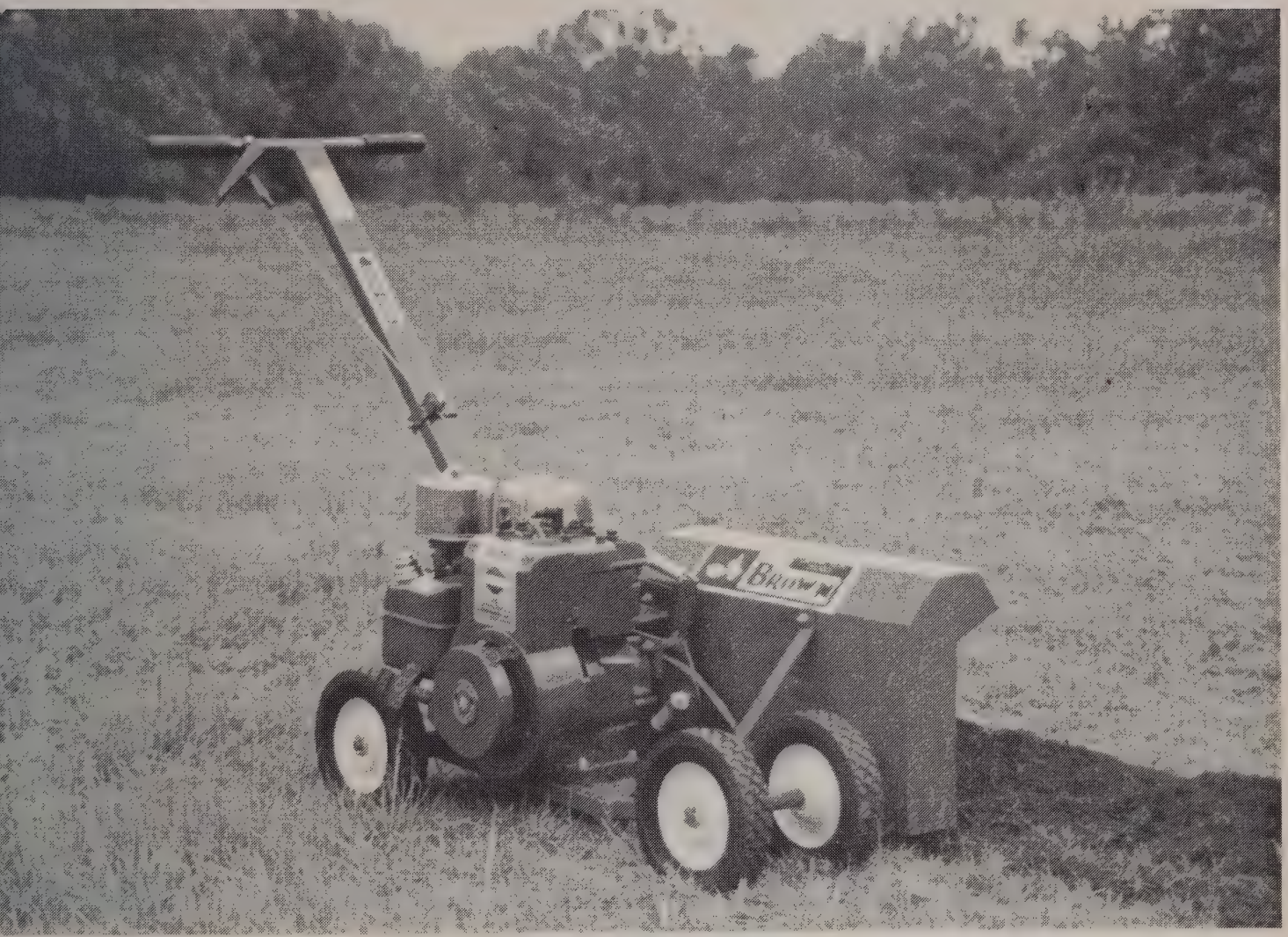

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All About Stereo Broadcasting

... including how to add a stereo processor to your mono receiver

by Richard Maddox

THERE ARE SIX BASIC TYPES of analog audio broadcasting currently being sent via satellite. The most common form is a mono channel at 6.8 MHz using wideband deviation. Virtually every receiver can tune-in this type of broadcast. The other methods are: mono channel using narrow deviation, discrete stereo using both wideband and narrowband format, matrix stereo, and multiplex stereo.

Both discrete and matrix stereo require two separate tuning sections. This is why there are two audio tuning controls on most stereo receivers. The sole type of stereo that can be tuned-in using only one control is multiplex stereo.

Some of the earliest stereo satellite receivers offered built-in multiplex stereo, as it was assumed that this would be the predominant method of stereo broadcasting. As satellite broadcasting has developed, however, discrete stereo has taken over the lead, with matrix and multiplex stereo broadcasting unable to keep pace.

TABLE 1: Matrix Decoder Algebra

A = Main or channel one tuning control
B = Sub or channel two tuning control

If A is tuned to 'L + R' and B is tuned to 'L − R,' then correct stereo channels are derived.

1A. Correct left channel decoding

(L + R) + (L − R) = left channel only

1B. Correct right channel decoding

(L + R) − (L − R) = right channel only

If A and B are tuned to the same channel (L or R), then the left channel is correct, but the right channel is cancelled out.

If A is tuned to 'L + R' and B is tuned to 'L + R', then left and right channels will be out of phase with one another.

1C. Incorrect decoding (also used to set null)

(L + R) + (L + R) = 2L + 2R on left channel (mono)

(L + R) − (L + R) = right channel cancelled out

Discrete Stereo

Discrete stereo uses two subcarriers. One contains the left-hand channel information, and the other contains the right-hand channel information. Usually, the lower frequency subcarrier is the left channel.

In most cases, a discrete stereo broadcast is not compatible with mono receivers, since it only receives either the left or right channel. There are transponders, however, such as the Nashville Network, where a monophonic third channel is also broadcast (after combination of the two discrete left and right channels).

Discrete stereo is broadcast using both narrowband and wideband deviations. In most cases, the wideband deviation is used for the video program's audio, while narrowband is used for FM radio broadcasts. Most narrowband channels are broadcast next to each other. As an example, WFMT (G1, Tr3) is broadcast on 6.30 MHz and 6.48 MHz. The left channel is on 6.30 MHz and the right is on 6.48.

The Wegener 1600 System

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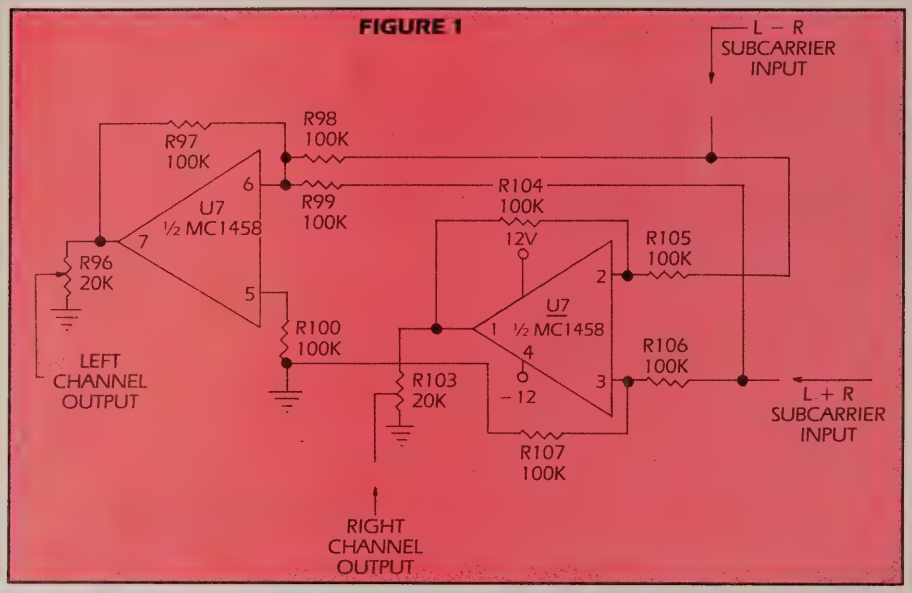

with the subcarriers on WGN and WTBS (G1, Tr3 and Tr18). Such FM radio channels as the Moody Broadcasting Service, the Cable Jazz Network, Satellite Jazz Channel (KKGO), WFMT, and all the Satellite Cable Audio Networks (SCAN) use this system.

The Wagener system can be broadcast in discrete stereo or in mono. The channels are broadcast using a companded signal and a narrowband deviation of +/−50 KHz. The biggest advantage to this system is the number of channels that can be broadcast in a limited space. The main users of this type of broadcasting are the FM radio services.

Times-Mirror Stereo Transmission System

This system is wideband discrete. The left channel is on one subcarrier, while the right channel is on a separate subcarrier. There is usually no noise reduction or companding applied to the signals. Examples of this type of system are CMTV (Country Music TV), the Nashville Network, and ESPN.

There is no special processor involved in receiving these signals. All that is required are two independently tunable audio demodulators.

Matrix Stereo

Matrix stereo also uses two subcarriers. One carries the L + R (left plus right) signal, while the second carries the L − R (left minus right) signal. To decode the two subcarriers into left and right channels requires a matrix decoder. This system is compatible with mono receivers, since the L + R channel contains both channels.

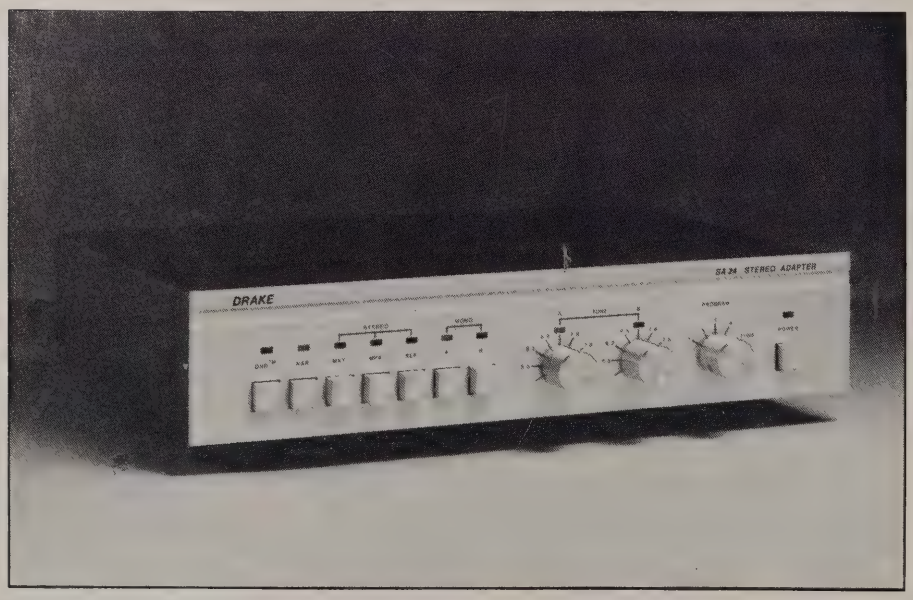

Figure 2 the Drake Model SA-24.

The biggest advantage to this system is the number of channels that can be broadcast in a limited space.

Table 1 shows the matrix decoder algebra. (Just like high school algebra! And you thought you'd never get to use it again). The matrix decoder electronically sums and subtracts the two subcarriers from each other to derive discrete left and right channels. A typical simple decoder circuit (from a Drake SA-24 stereo decoder) is shown in Figure 1.

The circuit consists of a two section IC and a handful of 100K resistors. The 1458 is a dual differential amplifier. This means that it has two sections with two inputs per section (pins 2 and 3 for section U7−, and pins 5 and 6 for section U7+) and one output (pin 1 for U7−, and pin 7 for U7+). It amplifies the difference between the two inputs.

Section U7+ is used to add the two input signals together. The two input signals are combined through R98 and R99 and sent to pin 6. Pin 5 is referenced to ground; therefore, the signal from pin 7 is the electronic sum of both channels. Thus, only the left channel is remaining. The algebra is shown in Table 1a.

Section U7− is used to get the difference between the L + R and L − R signals by having the L + R signal enter through R106 and the L − R signal enter through R105. Here the difference between the two channels is output from pin 1, with only the right channel remaining. The algebra is shown in Table 1b.

The volume of the left channel is controlled by R96, while R103 controls the volume of the right channel. In most matrix decoders, there is also a balance, or null, control. It is used to

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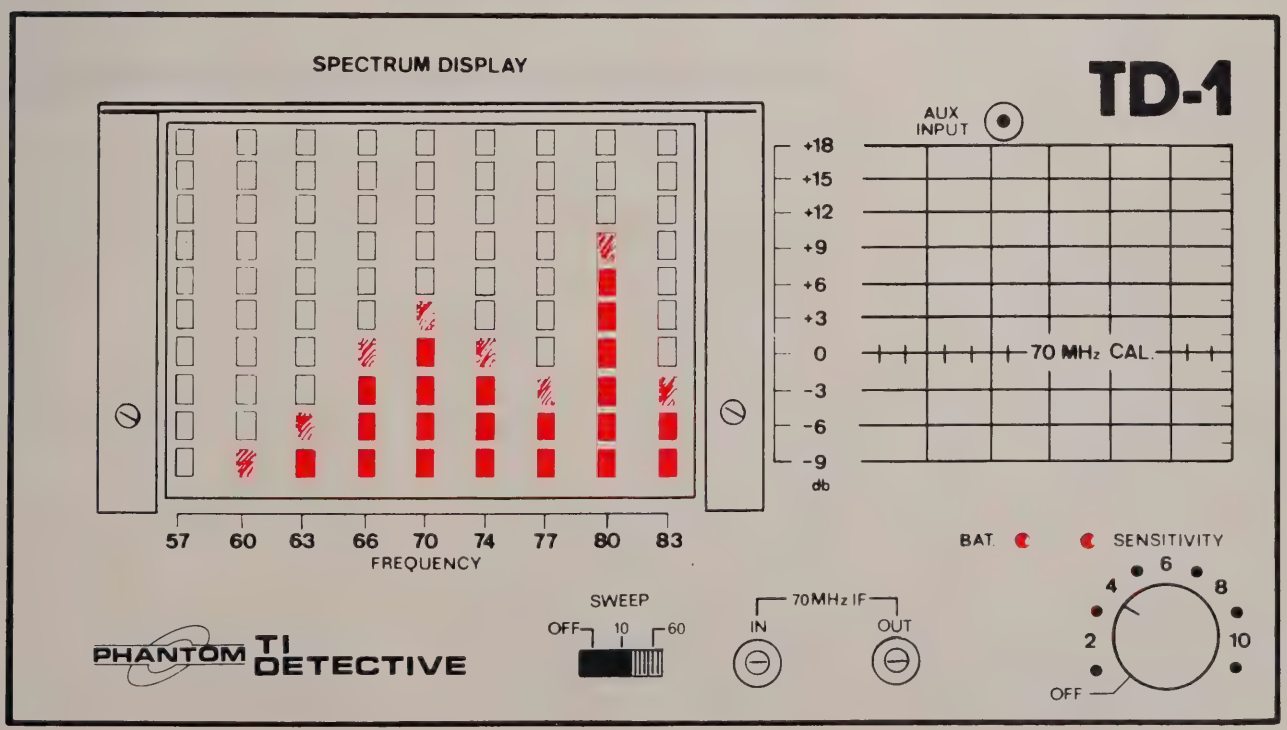
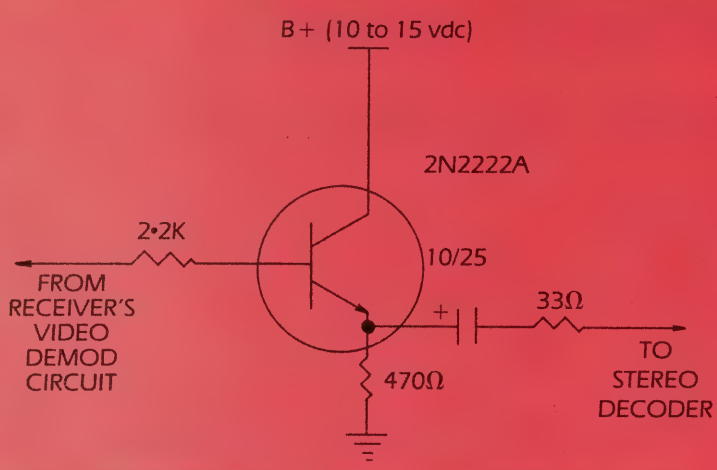


FIGURE 3



NOTE: Always use metal can style 2N2222

compensate for resistor value variations in the matrix circuit by adjusting the level of the L + R signal. Typically, it is adjusted by tuning both subcarrier tuning controls to the same subcarrier, and then putting the receiver in the matrix stereo mode. The right channel should be silent if the null control is set correctly. Why this happens is algebraically shown in Table 1c.

The Warner-Amex Stereo Transmission System

The Warner system is used on MTV, The Movie Channel, and the Disney Channel. It is a wideband matrix stereo broadcasting system. The Disney and Movie Channel frequencies are 6.8 MHz for the L + R subcarrier and 5.8 MHz for the L − R subcarrier. MTV uses the same L − R subcarrier frequency, but it uses 6.62 MHz for the L + R subcarrier.

A matrix broadcast can be identified by one loud subcarrier and one blank or very low subcarrier which, in the case of MTV, will consist mainly of reverberation and echo. There are also supersonic control tones for local ad insertion by cable companies. These can bleed through during demodulation and can cause a harshness to the sound, especially in the case of MTV, when the VeeJays are talking.

Multiplex Stereo

Multiplex stereo is broadcast using the Leaming Multiplex Broadcasting System. It is the oldest stereo broadcasting system (designed for cable transmission) that is currently in use, having been originally designed over 15 years ago. It has been used for over six years on satellite transmissions.

The Leaming system is similar to that used to broadcast standard over-the-air FM radio. It consists of one standard audio channel, which contains the L + R information, so it is compatible with mono receivers. On top of the standard audio channel is a second channel. It is transmitted using a double-sideband suppressed carrier (sort of a sub-subcarrier) modulated at 38 KHz. It contains the L − R channel. The main channel contains a 19 KHz pilot signal which the multiplex decoder uses to decode the L − R channel.

The main difference between standard FM-multiplex and Leaming satellite multiplex is in the deviation and modulation processes that occur to the signal. The total deviation is much greater in the satellite system and is a function of the degree of stereo separation. This type of broadcasting is called adaptive deviation.

Adding A Stereo Processor Onto Older Receivers

The earliest receivers were all single channel, fixed-tune audio types that could only detect wideband audio. In many cases, they were preset to only one or two channels, 6.8 MHz and 6.2 MHz. The original Westar picture audio carrier was 6.2 MHz, while 6.8 MHz was the Satcom choice. Obviously, the Satcom choice has become the defacto standard.

If you have an older mono receiver without a subcarrier jack on the back panel, how do you upgrade to stereo without buying a new stereo receiver? The answer is to get a component called a multi-mode stereo processor, or stereo adapter. Many companies make (or in some cases made) them, including KLM, Arunta, Sat-Tec, and Drake.

The KLM stereo processor even had a built-in five-watt per channel stereo amp for direct hookup to a pair of bookshelf speakers. The Drake Model SA-24, shown in Figure 2, is a variable tune stereo audio receiver which can receive both wideband and narrowband subcarriers in three stereo formats, as well as mono. It has four presets for MTV (F3R, Tr11), WFMT (G1, Tr3), TMC (G1, Tr14), and the standard wideband 6.8 MHz subcarrier. It also has a built-in noise reduction circuit.

There are only a few different types of demodulation circuits used to detect audio in the majority of receivers, and almost all of them use ICs. Thus, it is possible to give 'generic' instructions on adding a baseband output.

Adding A Subcarrier Output

To use an external multi-mode stereo processor, baseband video is required to be output from the receiver. The baseband video output may also be referred to as raw video, subcarrier out, or baseband audio. It is an unfiltered, unclamped signal that contains the demodulated video (from 30 Hz to 4.2 MHz), as well as all the un-demodulated audio subcarriers (from 4.5 MHz to 10 MHz).

AUDIO SERVICES

Note: In order to receive some audio subcarriers, your receiver needs a narrow band selector switch.

All audio services listed below are 24 hours a day except where noted.

Adult Contemporary (Starship)/Traditional MOR (5.58/5.76 DS)/F3, 6
AFRTS Radio Network/News,sports & network feeds (5.94 MN)/F2, 22
Album Tracks(Studioline)/Hit album selections(5.22/5.40 DS)/F3,19
All That Jazz (Studioline)/Big band and jazz music (5.94/6.12 DS)F3,19
Big Bands (Starship)/Big Band era music (7.785 MN)/F3, 6
Cable Jazz Network (Starship)/Jazz music (5.94/6.12 DS)/F3, 8
Cable Radio Network/News, music & prog. hilites (5.8 MN)/W5, 2
CBBK-FM (Kingston)/English CBC-Eastern (5.76/5.94 DS)/AD, 16, 24
CBM-AM (Montreal)/CBC programming (6.12 MN)/AD, 20
CBOF-FM/English CBC programming(5.76/5.94 DS)/AD,16, 24
CBU-FM/English CBC programming(5.76/5.94 DS)/AD,22
CFRB-AM(Toronto)/MOR contemporary music(7.875 MN)/AD,4
CHFI-FM(Toronto)/MOR-beautiful music (6.8 MN)/AD,8
CIRK-FM(Edmonton)/Progressive rock(6.17 MX)/AD,18
CITE-FM(Montreal)/French MOR music (6.17 MN)/AD,14
CKAC-AM(Montreal)/French MOR music (5.41 MN)/AD,14
CKO-FM(Toronto)/News and information (6.17 MN)/AD,8
CKRW-AM(Whitehorse, Yukon)/Country & western (5.41 MN)/AD,23
Comedy Specials (Starship)/Comedy and specials (7.695 MN)/F3,6
Contemporary Music Via Satellite/Background music (5.0 MN)/W5,18
Country Coast to Coast/Modern country music (5.94/6.12 DS)/G1,3
Country-Western (Starship)/Country-western music (5.40/5.94 DS)/F3,6
CNN Radio Network/News updates (6.3 MN)/G1,7; F1,3; F3,14
Dallas Taping for the Blind/Reading service for the blind (6.2 MN)/F4, 21
Easy Listening/Background music (6.2 MN & 6.5 MN)/W5,18
50's, 60's and 70's (Starship)/Top 40 music (6.435 MN)/F3,6
FM America/Easy music&live call-in TVRO show daily at 9 pm ET(6.2 MN)/T3, 18
Gold Mine Radio Network/Country & Western classics (7.92 MN)/F4,23
Greek Network, The/Greek language news, music & sports (7.335 MN)/F4, 23
InStore Satellite Network/Background music (5.4/5.8 DS & 7.38/7.74 DS)/D4, 20
In Touch Network/Reading service for the blind (7.875 MN)/F3, 6
Italian Network, The/Italian language news, music & sports (7.425 MN)/G1, 15
KRBE-FM(Houston)/Pop-rock music during HSE billboard (6.8 MN)/F4,11
Lifestyle (Seeburg)/Easy listening music (7.695 MN)/G1,3
Lifestyle AC (Seeburg)/Adult contemporary music (8.145 MN)/G1, 15
Love Sounds (Starship)/Contemporary Christian music (6.30/6.48 DS)/F3, 8
Moody Broadcasting Network/Christian prog. (5.40/7.92 DS)/G1, 3
Music by Muzak/Background music (5.58 MN)/W5, 18
National Museum of Broadcast Radio/Old radio shows & music (6.2 MN)/F4, 21
Nice & Easy (Starship)/Easy listening music (5.58/5.76 DS)/F3, 6
Rock Sounds/Top 40 rock music (5.4 MN)/W5, 18
Rock Channel, The (Starship)/Upbeat top 40 rock (7.37/7.56 DS)/F3, 6
Rythmix (Studioline)/Adult contemporary dance music (5.58/5.76 DS)/F3, 19
Satellite Jazz Network/Jazz programming from KKGO, LA (5.58/5.76 DS)/F3, 4
Satellite Music Network/Country Music (7.56/7.92 DS)/F4, 7
Satellite Music Network/Easy listening (7.38/7.56 DS)/G1, 3
Satellite Radio Net./Gospel music & ministries (6.2 MN)/F3, 2
Sheridan Broadcasting Net./MOR, news & sports (7.38/7.56 DS)/W5, 18
Specials (Studioline)/Specials and variety music (6.3/6.48 DS)/F3, 19
Stardust/MOR from 1940s to 80s (8.055/8.145 DS)/G1, 3
Starstation/Adult Contemporary (5.58/5.76 DS)/G1, 3
StudioLine/Country music (7.0 MN) & Rock music (7.5 MN)/G1, 13
Transtar II/Country music (5.58/5.76 DS)/T1, 9
Transtar III/Adult contemporary music (7.38/7.56 DS)/T1, 9
VOCM (St. Johns)/Adult contemporary (6.17 MN)/AD, 23
WFMT-FM(Chicago)/Classical music (6.3/6.48 DS)/G1,3
WJIB-FM(Boston)/Easy listening during NESN billboard (6.8 MN)/F4, 21
WQXR-FM(New York)/Classical music (6.3/6.48 DS)/G1, 15

If such an output is available, then all one needs is a shielded patch cord with the proper connectors (and a stereo processor, of course). If such an output is not present, then, for most receivers, one can be added at very little cost. All that is usually required is a small DC blocking capacitor (fairly non-critical, a .01 is fine), some miniature 75 ohm coax cable and, if you want to get fancy, a rear panel RCA jack. Add fifteen minutes of your time and you've got a baseband video output.

Of course, there are always exceptions. There are receivers that filter the video before any amplification takes place, and they may require an emitter follower to drive the baseband output. But fear not, it is a simple circuit and can be hooked-up on perfboard or just soldered up, lead to lead. It is schematically shown in Figure 3. Any NPN transistor with a response to 15 MHz will work. If the 2N2222 is used, it should be the metal can type.

The point that the baseband output is tapped off of is right after the video demodulator, before the video is filtered or de-emphasized. Usually there is a bigger transistor right after the demodulator circuit that is used to supply a low impedance to the video circuit and to the audio demodulation circuit.

The point that the baseband output is tapped off of is right after the video demodulator, before the video is filtered or de-emphasized. Usually there is a buffer transistor right after the demodulator circuit that is used to supply a low impedance to the video circuit and to the audio demodulation circuit. Whether there is enough signal there to drive the stereo processor depends on the type of demodulator used, and the model of processor that is to be attached. Normally the signal level must be at least 10 to 15 millivolts.

To determine the exact location at which to tap off the signal without a schematic, probe around the output of the demodulator circuit with an oscilloscope probe. Look for a video signal with a level of at least 10 mV. Be aware that the video level increases as it is amplified, but that in almost every receiver it is filtered before it is amplified very much. Thus, there may be a great signal level, like 1 volt, but everything above 4.2 MHz is probably rolled off so far that it won't properly drive a decoder.

The following examples show how to tap the baseband signal off several receivers. These may or may not be the best points, but they all work without affecting the circuit too much. In some cases, the video level will be slightly loaded down. Adjusting the video drive level should compensate for any circuit loading. If it won't fully compensate, then you are tapping into the wrong

place or should be using the buffer that is illustrated in Fig. 3.

One final note, in most cases these modifications will not void the warranty unless a future problem is directly accountable to the circuit or its installation. If the receiver is still under warranty, to protect yourself, or your customer, you should contact the manufacturer before proceeding.

A matrix broadcast can be identified by one loud subcarrier and one blank or very low subcarrier which, in the case of MTV, will consist mainly of reverberation and echo.

Luxor 9530

The 9530 didn't have a narrowband switch, so the easiest way to get the narrowband carriers is to use a stereo processor. The best place to tap off the signal is from the junction of resistors RA05 (82 ohm) and RA06 (150 ohm). They are located at the left front of the main video board, near the video input cable that comes from the RF board. They form a voltage divider on the emitter of transistor TA01, which is an emitter follower. Tapping off at this point will not affect the video at all. Use a .01 cap and a shielded cable to run to the back panel. Ground the shield at the rear panel only. Use shrink tubing and an axial (resistor-body style) capacitor.

Gould/Dexcel D3R 1000 and D3R 1100

Both receivers use a PLL-type demodulator, and thus show a fairly low signal level out of the PLL chip. Both use a transistor (2N2222 or 2N3013) as an emitter follower to drive the audio demodulator MOSFETs and the following video amplifier (uA733). Because the video is de-emphasized and filtered before the first stage of amplification, it must be taken off at the emitter of this buffer transistor.

In the D3R 1000, the transistor is labeled Q1 and in the D3R 1100 it is called Q3. In both receivers, it is located near the center of the main board. There is a trace that goes from the emitter of the transistor to two or three resistors—R21, R22 and R38 in the 1000, and R25 and R137 in the 1100. There is a space for R24 (which is not used), between the resistors in the 1100.

The cap should be soldered using the hole originally designed for R24 in the 1100, or to the trace itself in the 1000. There is a large ground plane that could be scraped and the ground attached if the cable is to be run directly to the decoder. If an RCA jack is used, ground the coax at the rear panel. Use shrink tubing to insulate the capacitor and cable end.

To keep the circuit from being loaded down excessively, one other part is necessary in the 1100. A 10K resistor should be paralleled with R23, which is also a 10K resistor. R23 is located on the opposite side of Q3. Solder the added resistor using short leads directly to R23. This increases the drive level to the emitter follower. If the video level needs to be raised, use RV3, the video level control. It is the same for both receivers.

If there is insufficient drive level for the processor, then the circuit from Figure 3 must be used. It can get its B+ voltage (+ 12 VDC) from the collector of Q1 or Q3, or directly from the output of the 7812 voltage regulator.

KLM Sky Eye Series

On KLM receivers without a stereo processor 'out' jack, the baseband signal is taken off of the emitter of an NPN transistor (usually a 2N2222) labeled Q4 in the Sky Eye I and Q6 in the Sky Eye IV, V, VI, VII, Olympiad I and Celestial I. The level is high enough that only the .01 is necessary. Once the processor is hooked up, check the AFC centering on the receiver, as this signal is tapped off at the same point as the AFC and could possibly affect it.

Other Receivers

There are only a few different types of demodulation circuits used to detect audio in the majority of receivers, and almost all of them use ICs. Thus, it is possible to give 'generic' instructions on adding a baseband output. For most receivers, taking it right off the audio detector input works okay if you don't plan to use the internal audio circuit. The circuit may be loaded down and be adversely affected by just tapping into it with a capacitor. If that happens, use the isolation/driver circuit shown in Figure 3.

To identify what type of audio detector is used, first identify what ICs are used. Both the CA3089 and CA3189 are used at 10.7 MHz; this means that you must find the mixer that is used to actually tune in the channel and take it off from before that point. If the circuit uses a 1496 IC, then take the baseband from pin 1. If it uses a 1374 IC, take the baseband from pin 11. If there is a small transformer and four diodes nearby, then the baseband input is on the transformer's primary winding. Take the subcarrier out from that point or from the last driver transistor. If an NE564 IC is used, then the baseband input is on pin 6.

To determine the exact location at which to tap off the signal without a schematic, probe around the output of the demodulator circuit with an osciloscope probe.

On the USS/Maspro, TP2 can be used to get the high pass filtered baseband out. TP1 can be used to get the unfiltered video baseband out.

If all else fails, call the manufacturer. They should be able to guide you to the proper place to add-in the baseband output. ♦

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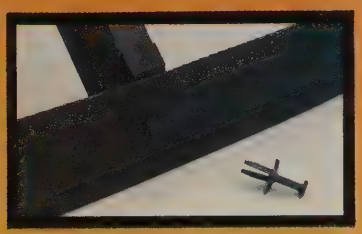

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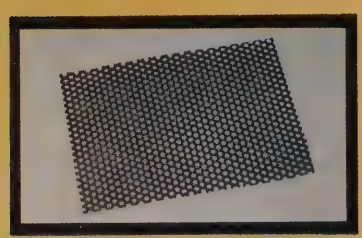

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COMPETITION among satellite dealers is increasing rapidly. Retailers have found that selling systems to walk-in traffic alone is a thing of the past.

The retail merchant trying to sell satellite systems must face the reality that competition is strong, as it should be in our industry. Strong competition in our free enterprise society brings about more affordable pricing and better products for the consumer. The 'get rich quick' boys are pulling back to find other unique products to sell. At last, our industry can get serious about selling quality products and services in a professional manner.

I have talked with many dealers lately who have hired or are thinking of hiring an outside salesperson. If properly executed, this is probably one of the best moves a retailer of satellite systems can make. If done haphazardly, the consequences may be difficult to recoup.

The first question that must be resolved is: Where do you find the right salesperson? I would be willing to bet that you are thinking in terms of using someone already on your staff or you are going to run an ad in your local newspaper. There is nothing wrong with either idea if you are willing to invest the time and money to properly train this person.

WANTED: PER SALESMAN

by Mike Stevens

Your chances of finding an experienced super salesperson through a classified ad or in your store are not good. Most successful salespeople are already doing what they do best and they are happy. Your best chance of finding a salesperson who may be interested in changing companies is through a well known, established employment agency. By professional agency I mean one that will screen, test, and evaluate the applicants for a particular position. If you choose this approach, don't sign any agreement with the agency until you are convinced they will deliver only qualified applicants.

If you elect to choose your salesperson from one of your current employees or through local advertising, be prepared to spend a lot of time with this person.

When looking for salespeople, many inexperienced employers look for the so called 'born salesman.' Let me save you some time and trouble. Regardless of popular belief, people are not born possessing any particular ability or talent. The only distinctive characteristic you have at birth is your sex. You are either male or female and in our society, neither of these characteristics dictates success or failure. Whatever a person achieves or becomes, or whatever talent he exhibits, is learned behavior. Stop looking for the born salesman, he is not to be found. If you study even a small portion of the volumes of material that have been written concerning success and failure, you will find one dominant factor. A single element determines one's success regardless of the endeavor. That single element is the burning desire to achieve.

Cheryl Prewitt illustrates this point. She was eleven years old when she was involved in an automobile accident. Her leg was crushed and over 100 stitches were required. When the injured leg healed it was considerably shorter than the other leg. However, Cheryl had a desire and in 1980 she was named Miss America.

One of the longest field goals ever kicked in NFL history was 63 yards. Tom Dempsey of the New Orleans Saints was the player who performed this feat. He made this kick with a foot that had no toes and was half the size of his other foot. There were two reasons for Tom Dempsey's success. The first was that no one ever told him he couldn't, and the second was simply his desire.

> Let me save you some time and trouble. Regardless of popular belief, people are not born possessing any particular ability or talent.

These illustrations are dramatic examples of achievers. Most of us have two good feet, legs, and eyes. Most of us have no physical infirmities to prevent us from becoming whatever we want. Many of us do lack the desire and that is tragic.

The next question is obvious. How do you determine if the person you hire has the desire to achieve? One question will answer this for you. Ask the applicant about his goals in life. If he gives vague answers such as health, happiness, or financial security, go on to the next applicant. These are not goals, they are conditions. If he says his goal is to earn X number of dollars by the time he reaches a certain age, or if he says he wants to be president of a specific company within a given time frame, hire that person. This employee may not be with you for long, but he will do more for your business than many who may be with you for a lifetime. A person with a specific goal has a purpose and a desire to achieve.

Now that you have the right person, you cannot allow him to wander aimlessly. He must be given direction. You should see that he is properly trained in the art of selling. As owner of a business, you undoubtedly possess a great sales ability whether you realize it or not. You are in the position to impart many of your personal experiences with this person. However, unless you have had sales management or sales training experience, you may do more harm than good.

A good sales trainer is a wise investment. There are many excellent trainers and training sessions. Hardly a month goes by in any metropolitan area that sales seminars are not offered. Many colleges and universities offer such courses. The resources are available if you take the time to look. Make these resources available to all of your employees. Be sure that you also take advantage of these resources.

I have found many TVRO dealers whose expertise leans toward the technical side of the business. If you take your technical knowledge and blend it with solid sales training you will find your business much better off than before.

I have already mentioned the importance of having set goals and objectives. You should give thought to establishing goals for your business. Once established, the goals should be shared with the employees. Everyone will do a better job of reaching the objectives if they know where they are headed. ♦

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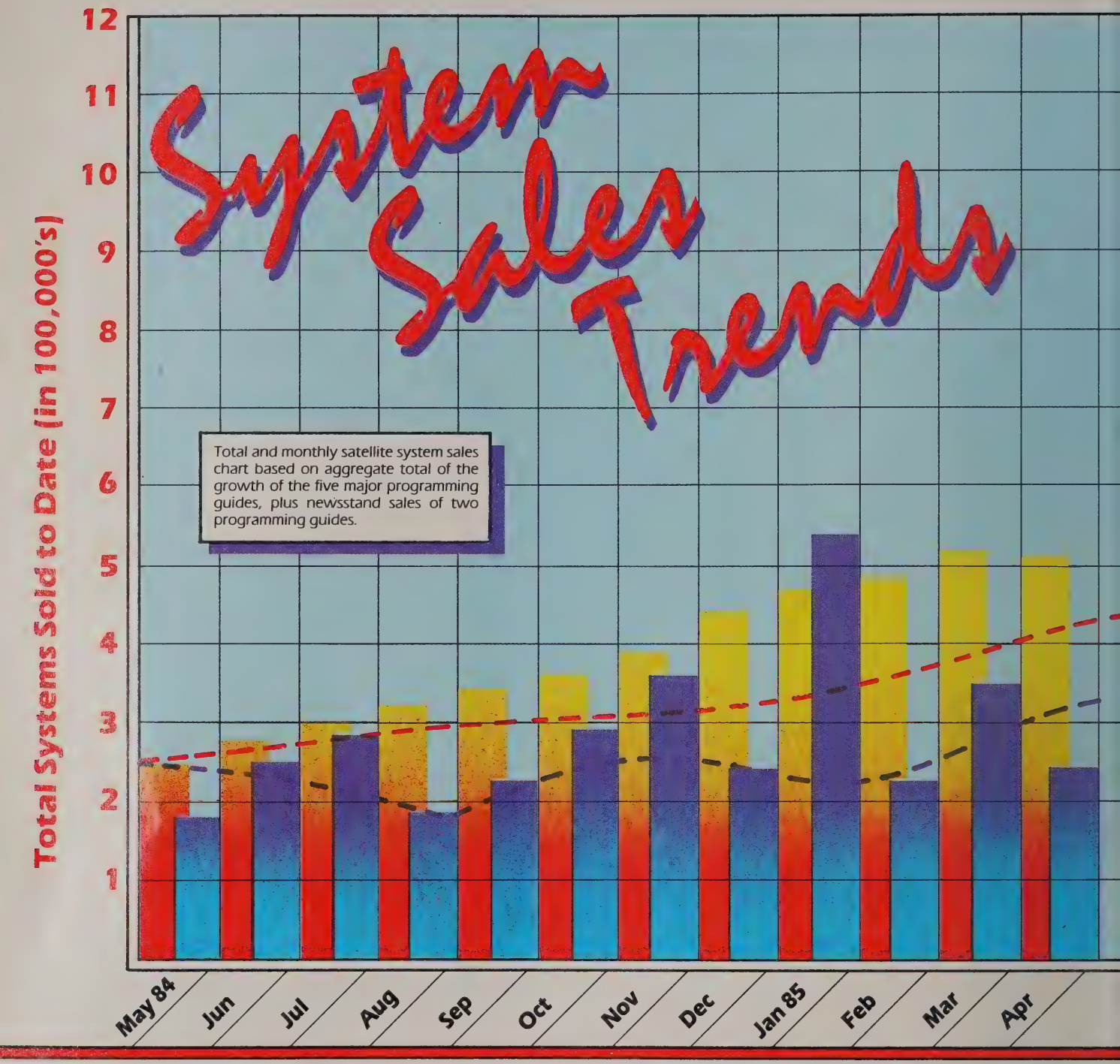
System Sales Trends



THE SYSTEM SALES PICTURE THIS month is quite gloomy and in fact the overall industry mood is worse than the numbers would indicate. In other words we are in a slump.

The total number of programming guides mailed in November was 909,012 which represents an increase of 57,908 over the previous month.

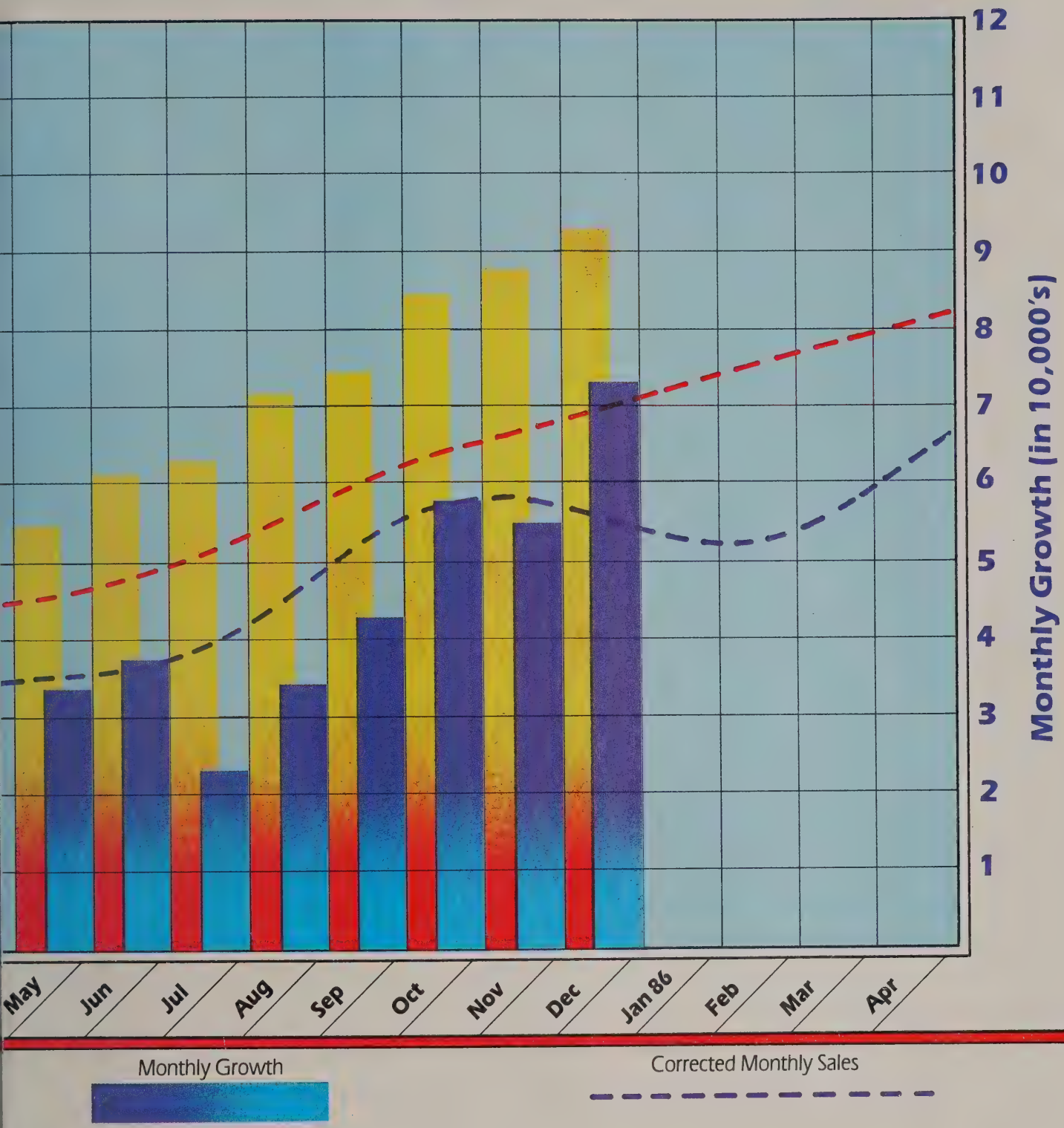
	Postal Report	Corrected Totals
A	20,141	15,900
B	29,476	6,500
C	2,415	1,945
D	7,903	11,000
E	−2,027	2,000
	57,908	37,345

Newsstand Gross Sales
53,000

Factored Newsstand Sales*
21,200

Corrected Monthly System Sales
58,545.00

*Based on the assumption that 40% of newsstand sales reflect new system purchasers.



Coupled with newsstand gross sales of 53,000 (an increase of 6,000) we are very close to the magic one million mark. This total, however, does include free samples sent to consumers and multiple copies provided at no charge to nearly every active dealer in the country. Subtracting this estimated free distributor copies we end up with a net total of 725,000 programming guides, which falls far short of SPACE's estimate of 1.7 million systems installed to date.

Are we to assume that 50% of home satellite viewers do not subscribe to a programming guide? It seems unlikely, yet if the 1.7 million estimate is accurate and the US Postal reports are accurate we must assume that the programming guides have penetrated only 50% of the market.

Projections for the first quarter of 1986 must be conservative but also reflect the possibility that consumers who have held off purchasing may decide to take the plunge early in 1986. Our current estimates indicate an average sales of 56,000 per month for the first three months of 1986. The big question is how many manufacturers, distributors and dealers will survive the weak conditions? Only the next few months will provide the answer to that question.

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News News News

MTI/Pentec Files Chapter 11

MTI/Pentec of Salt Lake City has filed for protection from creditors under Chapter 11 of the Bankruptcy Act. MTI was once the dominant manufacturer of motor drive controllers but had suffered a serious loss in market share during the past 12 months.

Showtime/TMC Recognize TVRO

Unconfirmed sources indicate that Showtime/The Movie Channel, which plans to scramble in the spring of 1986, will address the home satellite market. Reportedly Showtime will offer to sell or lease the M/A-Com Videocipher descrambler. The charge for the service is expected to be $6 to $8 per channel plus $5 to $8 to lease a decoder. A package of basic services may also be offered for an additional fee. At present this is just conjecture and we will just have to wait and see.

Sears Enters Satellite Market

Sears' official stand on their entry into the satellite business is "Mum's the Word." There is no doubt, however, that they are waiting on putting a package together which will include consumer financing. Speculation is that Sears has completed market studies and plans to introduce satellite systems at selected locations early in 1986. An official announcement is expected shortly.

Anonymous Satellite Pirate

Eastern Microwave, which is the company that uplinks both WOR and Showtime, has sent letters of complaint to the FCC claiming intentional interference to their satellite feeds by person or persons unknown. EM reported that both transponder 15 and 16 was subjected to interference for 14 hours several weeks ago.

Industry Standards Committee Reports Progress

Guy C. Davis, Chairman of the Industry Standards Committee, recently announced progress toward the establishment of voluntary industry standards made by the committee during its recent Dallas meeting.

"The Industry Standards Committee continues to make increasing progress toward the establishment of viable, voluntary industry-wide standards for all forms of satellite TV equipment," Davis said. "The advances made at the most recent meeting are important, but we will need the continued support of all industry members. We have started the ball rolling, but we have to keep it rolling."

Davis reported the following progress made by each of the Industry Standards Committee's four sub-committees:

1) Subcommittee for Standardization of Interface
Chairman: Bruce Smith, Omni Spectra
The subcommittee drafted recommended specifications for:

1. Mechanical Servo-Type Motor to Receiver Interface.
2. Ferrite Feed to Receiver Interface.
3. Pin Diode Feed to Receiver Interface.
4. Feed Labeling Requirements at the Receiver.
5. Low Noise Amplifier Requirements at the Receiver.
6. Cable and Wire Requirements.

The first week in October, SPACE released these specifications to the industry for comment. After review of the resulting comments, they will be submitted to the Technical Review Committee.

2) Subcommittee for Suggested Testing and Measurement
Criteria: Active RF Components
Chairman: Frank Tackett, Star-Com

The subcommittee completed a list of specifications for which test procedures must be written. The first week in October, these specifications were released to the industry for comment and/or suggested test methods.

3) Subcommittee for Suggested Testing and Measurement
Criteria: Antennas, Mounts, Actuators and Feed Systems
Chairman: Lewis Larsen, L.P. Inc.
Vice Chairman: Greg Baer

The subcommittee has been subdivided into the following three panels:

a) Wind Capacity Test Procedures Panel
b) Antenna RF Test Procedures (Test Range) Panel
c) Antenna Drives Test Procedures Panel

Each panel worked independently of the subcommittee in drafting test procedures and submitted their recommendations to the full subcommittee at the November 18th meeting.

4) Subcommittee for the Aggregation and Dissemination of Laws and Regulations in the Earth Station Industry
Chairman: Nancy Turpin-Sherwood, Odom Antennas, Inc.

To date, correspondence, laws, regulations, licensing requirements and applications, and other research information have been compiled from 30 of the 50 states queried, from testing laboratories, from the FCC, and from other national and Canadian sources. This information is being compiled into a directory which will be published upon completion.

Davis stressed that the establishment of industry standards is an ongoing process; the voluntary standards which are initially set will evolve to keep pace with the evolution of satellite TV equipment and the industry.

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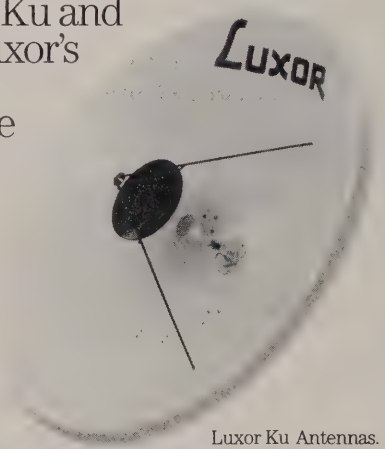
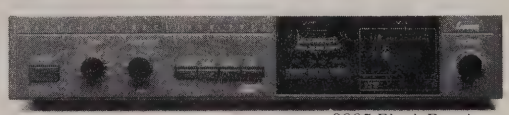


Luxor Ku Antennas.



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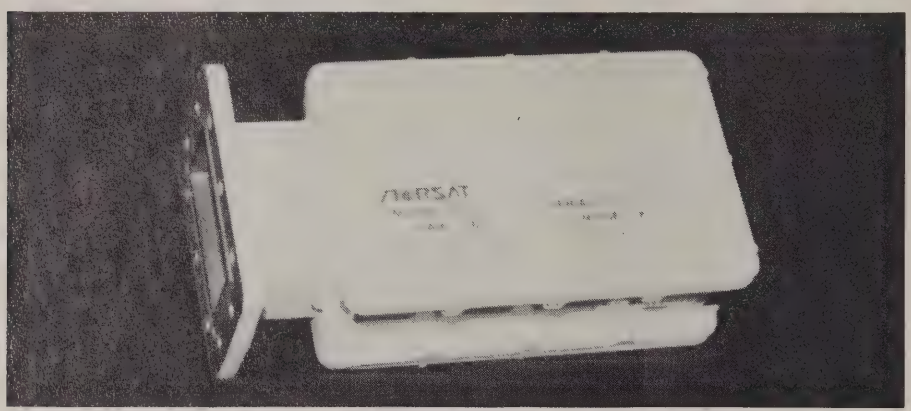
Focus On: LNBs

While the LNC was the forerunner of the LNB, evolution had to refine the downconverter and set the stage for the LNB.

by Bill Barr

THE LATEST BUZZ WORD IN THE home TVRO industry is integration. Receivers are including actuators and polarizers are joining with LNAs and becoming Polar Amps. The race is on to minimize the number of electronic components in the TVRO system. Two devices that are the most popular candidates for the twinning process are the LNA and the DC or downconverter, making it into an LNB (low noise block downconverter).



A typical low noise block downconverter is shown above.

What Is An LNB?

The LNB is a device which houses two components in one casing, such as the LNA and block downconverter. They are made in two basic IF (intermediate frequency) types: 950 to 150 MHz and 450 to 950 MHz.

As the housings are similar how can you visually decipher an LNA from an LNB? Observe the connector on the top of the device; an LNA will have a type N connector which is suitable for heavy RG213 cable. The LNB will have a much smaller connector, type F, which is used with RG6 or RG59 cable.

The specifications on an LNB are similar to the familiar LNA; noise factor (N/F) is given in degrees Kelvin. For example, an 85 degree LNA is better than a 100 degree LNA. The gain from the LNB is typically higher than an LNA as the downconverter gain is included. This will simplify calculations when factoring cable runs.

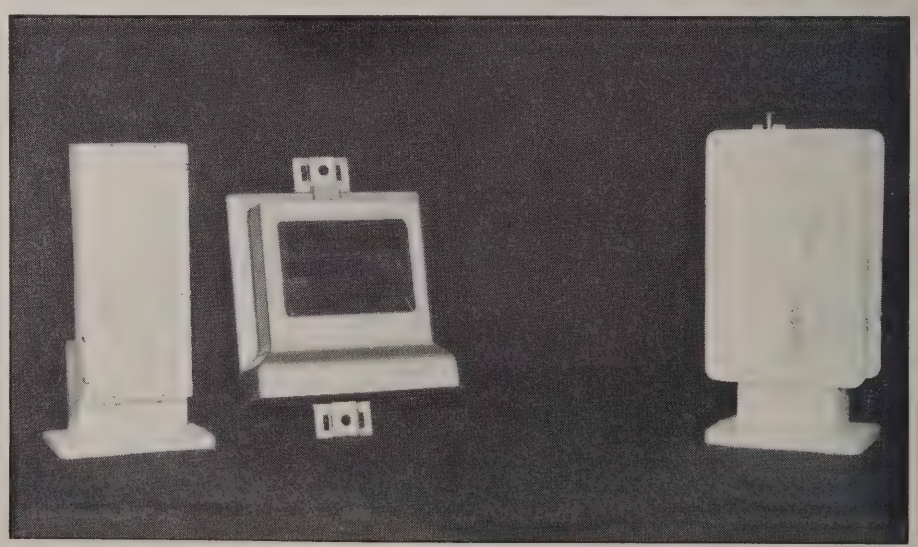
This is not the first attempt to combine similar components. Several years ago we were offered the LNC (low noise converter).

There were several reasons the LNC never reached the popularity of a separate LNA and downconverter. While the LNC was the forerunner of the LNB, evolution had to refine the downconverter and set the stage for the LNB.

Then, as now, manufacturers supplied the downconverters with their receivers. The LNA is still a hi-tech mystical device produced by only a dozen or so companies. The disciplines to produce an LNA are demanding, requiring tremendous investments in know-how and equipment.

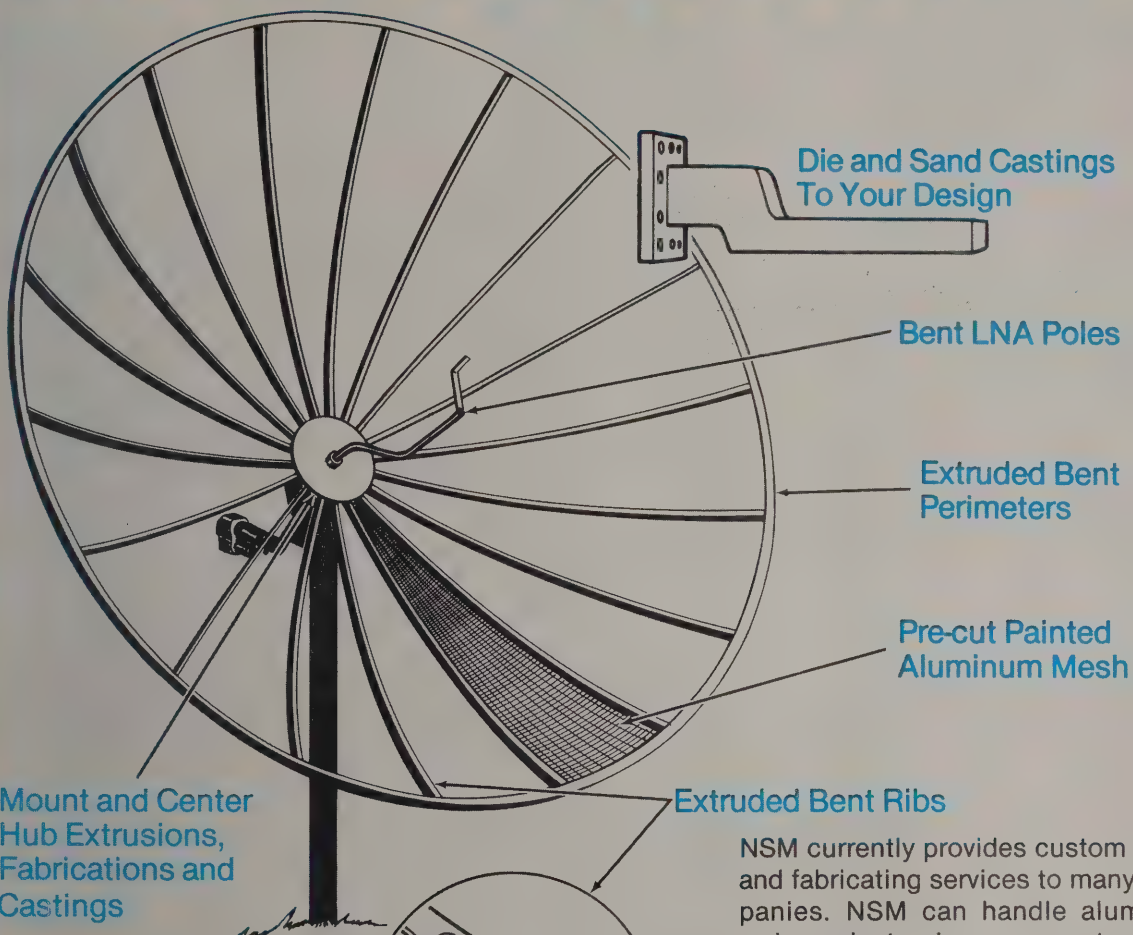
With older 70 MHz systems, receivers were carefully matched to a varactor tuning voltage curve supplied to the VCO (voltage controlled oscillator) in the downconverter. If the downconverter for a receiver malfunctioned and a replacement was substantial, the receiver usually had to be returned to match the characteristics of the new downconverter.

It proved difficult for the manufacturer to design and manufacture a



The LNB (right) will perform the same functions as the LNA and block downconverter.

Where Custom Satellite Systems Originate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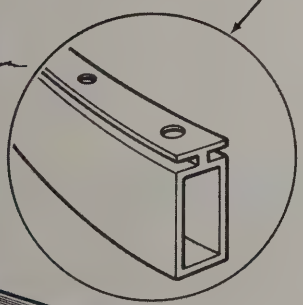

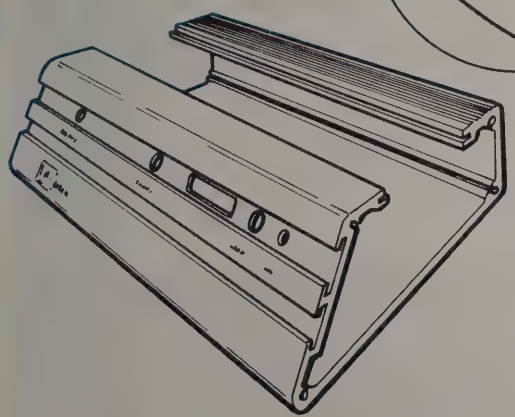

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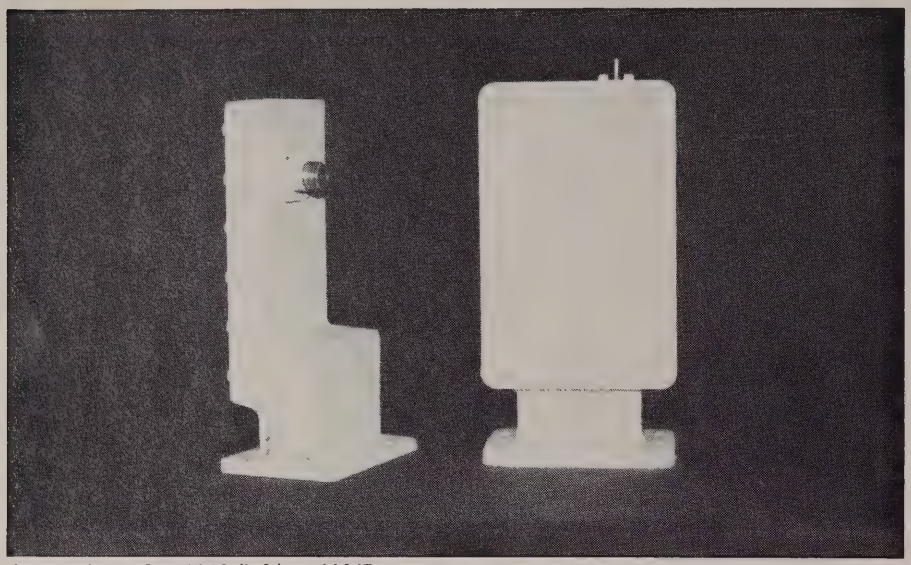


A rear view of an LNA (left) and LNB.

universal LNC. Those who attempted only achieved 10 percent of the market share. With the LNC, a receiver installer usually set up the channel alignment in the field and kept his fingers crossed that his AFC voltage compensation was nulled. In some cases, such as the Luxor 9530, 40, and 50 models, it was recommended that the installer center the AFC, which is not a simple task. Failure to do so resulted in poor stability and channel drift.

Production levels never reached those of the standard LNA and prices remained high. The LNC died and LNA and downconverter combinations reigned supreme until the advert of block conversion.

Block conversion actually started with Anderson Scientific and Electrohome in early 1981 but did not gain acceptance until 1984. The block device, like the normal 70 MHz downconverter, is installed outside, close to the LNA with a male/male N type connector or a short RG213 jumper. Early models drifted in frequency similar to the LNC or separate DC. It was again necessary to match each block downconverter to a receiver on the production bench, fire it up to a stable working temperature, adjust the tuning ramp in the receiver, and set the AFC.

Production levels never reached those of the standard LNA and prices remained high.

Every LNA manufacturer would dream of producing an LNB, combining the LNA with a Block Converter, but was deterred when his mind reached back to the inherent problems with the LNC. Enter the DRO (dielectrically resonated oscillator).

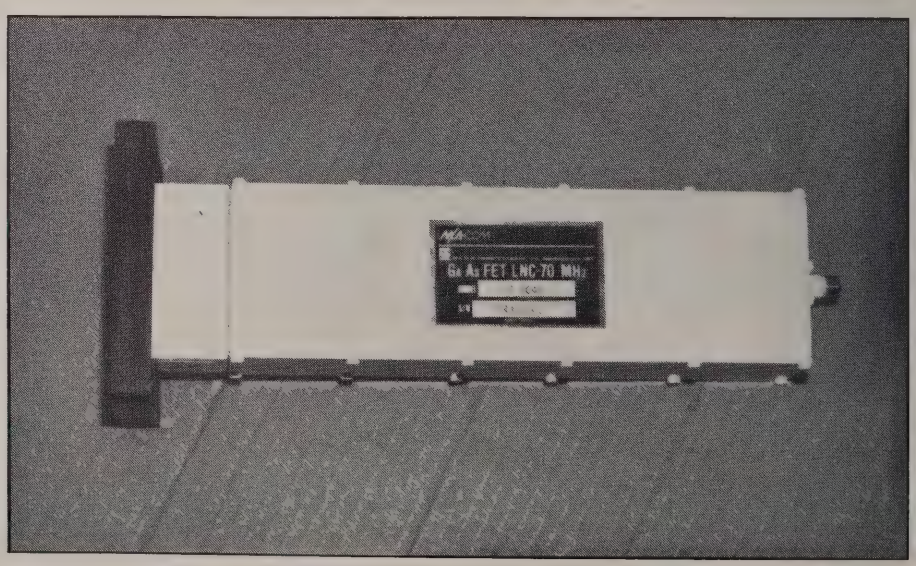
The DRO made the practice of matching downconverters to a given receiver obsolete because it offered exceptional oscillator stability. This device made it universally possible to use an LNA and interchangeable downconverter.

What the DRO does is enclose the oscillator in a cavity that is resonant at the fixed LO (local oscillator) frequency, producing exceptional stability over wide temperature ranges.

LNA manufacturers were quick to exploit the DRO possibilities, housing the downconverter with their amplifier unit, and producing what we now call the LNB.

Why were DROs not used in the old style downconverters? Simply because the oscillator did not run at a fixed frequency in a 70 MHz single conversion downconverter. To extract a wanted channel the oscillator tuned from 3770 MHz to 4270 MHz highside injection units or 3630 to 3930 MHz in lowside injection. You cannot make a resonate cavity for a variable frequency oscillator.

LNA manufacturers were quick to exploit the DRO possibilities, housing the downconverter with their amplifier unit, and producing what we now call the LNB (low noise block converter). The marketing war is now on. On one side is the receiver producer with his separate downconverter. In the other corner is the LNB manufacturer who is



The LNC, a forerunner to the LNB.

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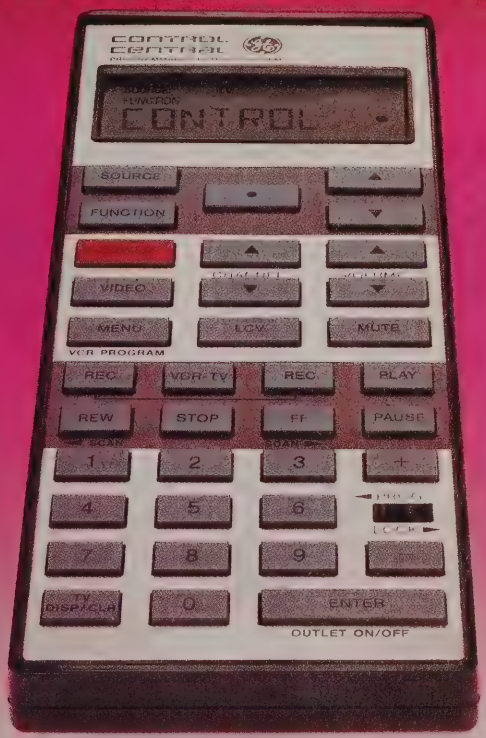

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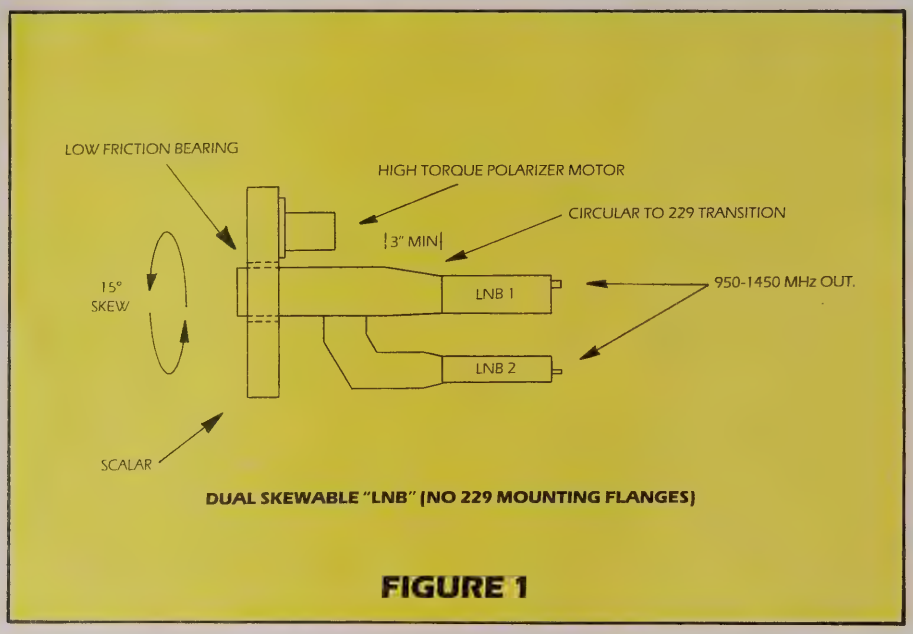


DUAL SKEWABLE "LNB" (NO 229 MOUNTING FLANGES)

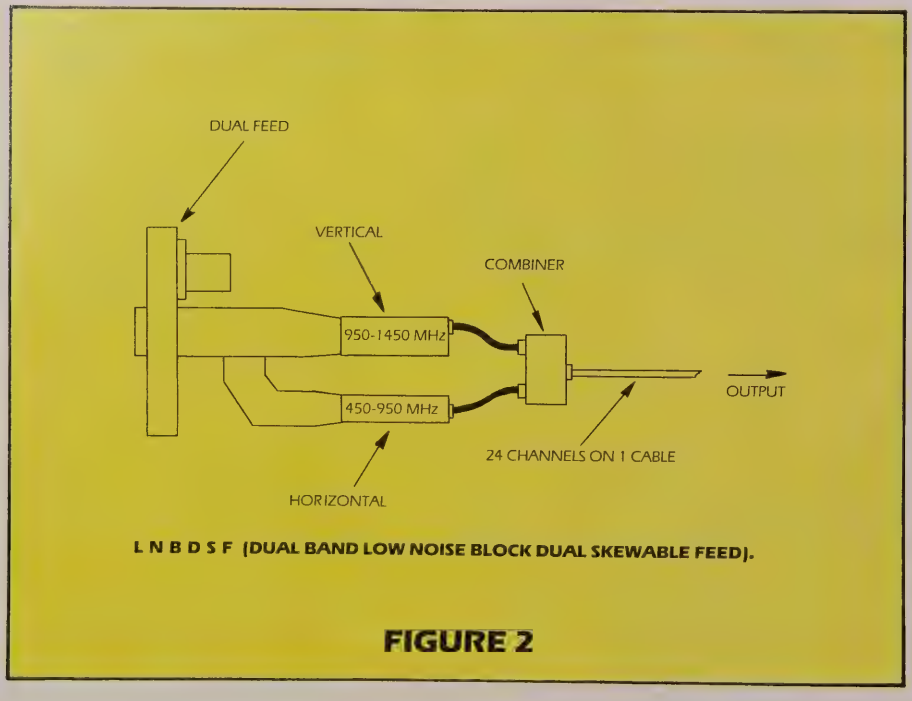
FIGURE 1

out to grab the downconverter portion of the marketplace away from the receiver producer.

Receiver designers are not about to roll over and play dead. If you figure out the price of an LNA with a separate downconverter it is typically 10 percent less than an equivalent noise factor LNB. Another interesting point—LNBs have not yet achieved the 'super low' noise temperatures, down to the 60 to 65 degrees region, of the singular LNA. However, keep in mind when you read the specs on an LNB the noise factor includes the noise contribution of the downconverter whereas the LNA spec applies to that device only and does not include the separate downconverter.

What Will The Future Bring For The LNB?

Integration will continue to the point where we will be introduced to several new names in the "Glossary of Terms" column. First up will be the LNBF or Low Noise Block Feed, an LNB married to a polarizer without the normal WR 229 mounting flanges. Presently, we bolt the LNB or LNA to a polarizer through a transition using 10 quarter inch diameter bolts. The LNBF will be internally coupled to the monopole that picks up the signal in the circular wave-guide of the polarizer through the Ga-As Fet stages of the LNA and into the translation stage, or block downconverter. The signal exits out the rear via the F style connector.



L N B D S F (DUAL BAND LOW NOISE BLOCK DUAL SKEWABLE FEED).

FIGURE 2

Unless we observe receiver manufacturers diversifying into LNBs in the near future they will have surrendered the downconverters to the LNA producer.

The next development will be DSBF or dual skewable block feed, a device consisting of a dual feed that is skewable—similar to the device presently in production by Boman. Unlike the Boman, two LNBs will be housed on the feed casting with no WR229 mounting flanges. Two RG6 feed wires run to each receiver, and polarizer skew is only 15 degrees to compensate variations in satellites.

To avoid running two wires to the receiver, designers are proposing a system which will have one LNB, vertical polarization at an IF frequency of 950 to 1450 MHz, and the other horizontal LNB at 450 to 950 MHz. These two signals are mixed, producing a mini-cable system, with 24 channels/1000 MHz wide on a single cable. This is very attractive as the installer only has to run one wire to each receiver.

Unless we observe receiver manufacturers diversifying into LNBs in the near future they will have surrendered the downconverters to the LNA producer. The industry standard will then become LNBDSF (low noise block dual skewable feed).

Development will cease, with few additional refinements possible. Then, as usual, mass production will drive the price down. A headlong rush to get to this point is now under development in many Labs in the USA and Far East. All this effort should become evident in the next two years. ♦

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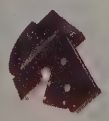

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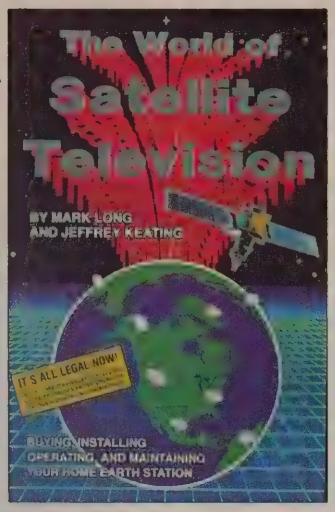
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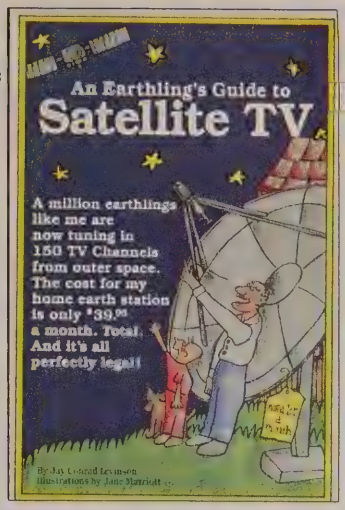
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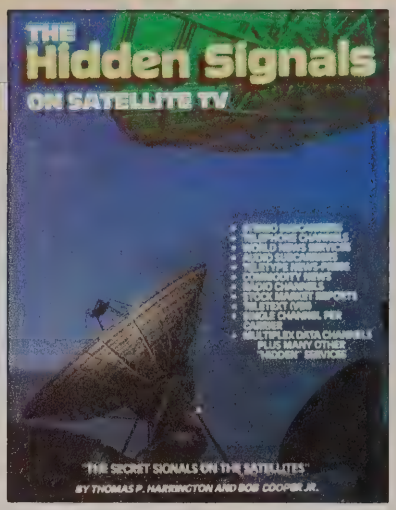

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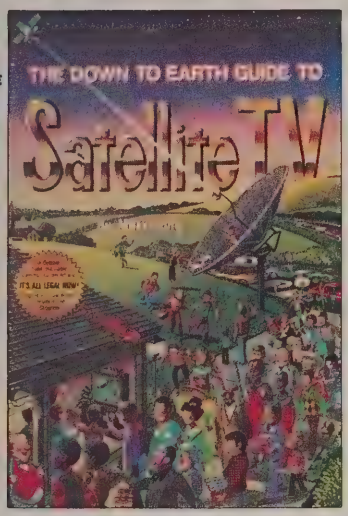

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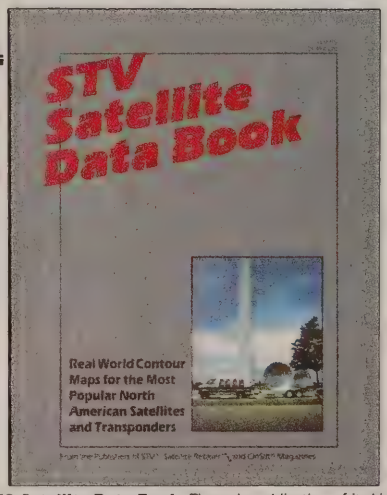

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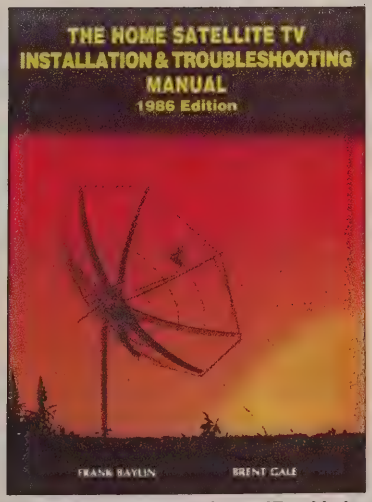

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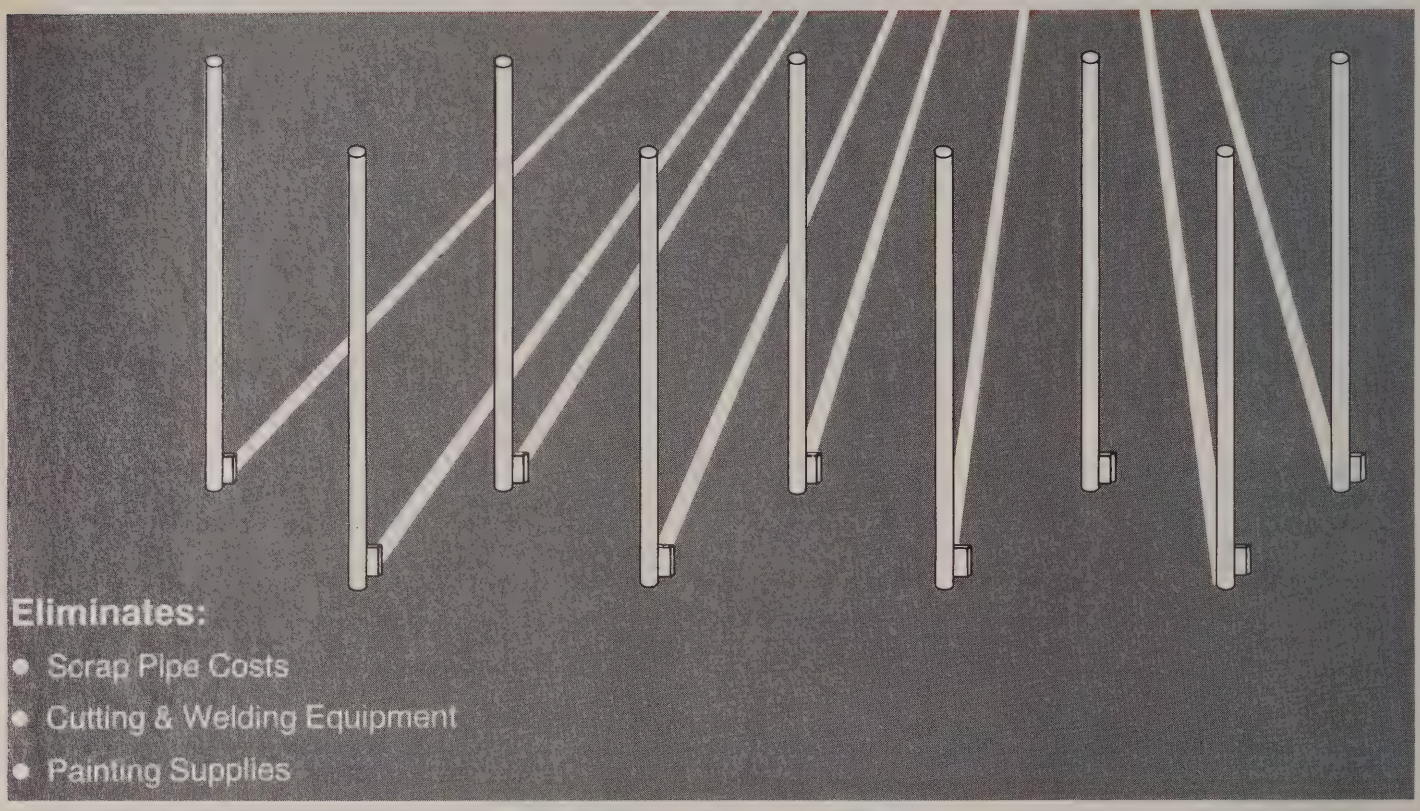

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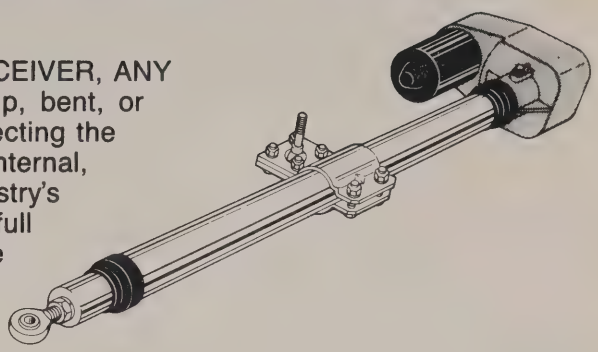

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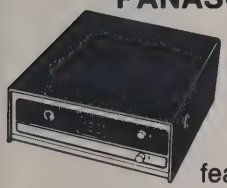

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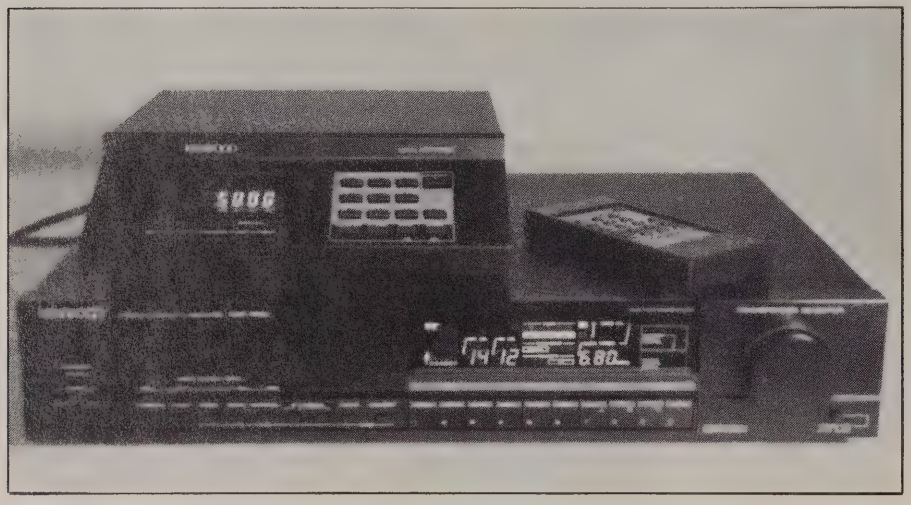
"Someone has to be building the world's finest antenna actuator"

The Kenwood KSR-1000 Satellite Receiver And KSP-1000 Antenna Positioner

by Mike L. Gustafson

Kenwood is a name that is well known in the high priced stereo market. With the introduction of the KSR-1000 satellite receiver, Kenwood Electronics wades into the home satellite market as well. Even though I own a MacIntosh stereo system, I still had high hopes for the operational quality of the KSR-1000. I was not disappointed! The Kenwood satellite receiver and antenna drive system almost, but not quite, made it into the excellent column in the data reduction test forms. The system would have made it into that untouched column if it had a couple of features that I consider important, more on that later. Even so, the Kenwood system tested out, performing right at the top of the competition.

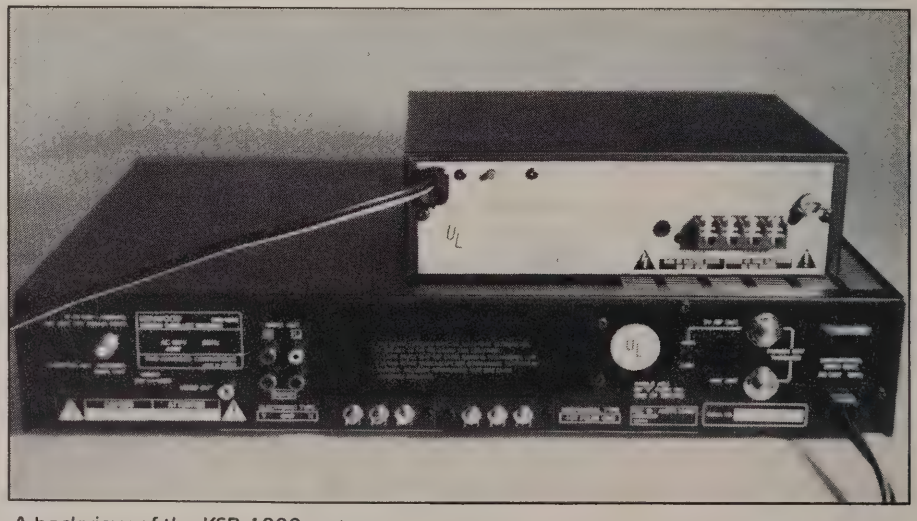


The Kenwood KSR-1000 receiver, antenna drive, and remote control.

The KSR-1000 receiver and KSP-1000 antenna drive system are manufactured in Japan by Kenwood Electronics, imported into the United States, and then shipped from Carson, California. The receiver comes with a 95 degree Kelvin, or lower, low noise block down-converter that uses an intermediate frequency of 950 to 1450 MHz. The receiver contains almost all of the features that any reasonable person could ask for, including stereo, dual audio bandwidths, Dolby noise reduction, remote control, and a very nice feather touch main channel tuning knob. The receiver comes with a pre-programmed read-only-memory (ROM) that has 14 of the most widely used special audio channels stored already. It also has 12 more memory positions for user-selected audio channels.

The companion KSP-1000 antenna positioner and KSA-900 actuator can be run separately, but it is primarily intended to operate with the receiver. The drive controller has 18 satellite memory positions and can be controlled via the remote control that comes with the receiver. When the two units are combined, many very nice things happen. Obviously, the first feature is that, from your easy chair, you can scan through all of the satellites and video channels. As you shuffle through all the different satellites, the receiver and drive keep track of the correct polarization formats and skew.

The front panel of the KSR-1000 receiver is dominated by a large gas discharge display that contains all of the system information, including: satellite aiming, the audio and video channels currently being viewed, stereo format and audio bandwidth selected, polarization format, and last, a light bar signal strength meter. The display is easy to read from across the room and is very pleasing to the eye. The only knob on the front panel is the main video channel tuning control. This knob is not like any other knob you have turned before. I don't know what type of technology it is, but I call it a feather touch control. Instead of being



A backview of the KSR-1000 system.

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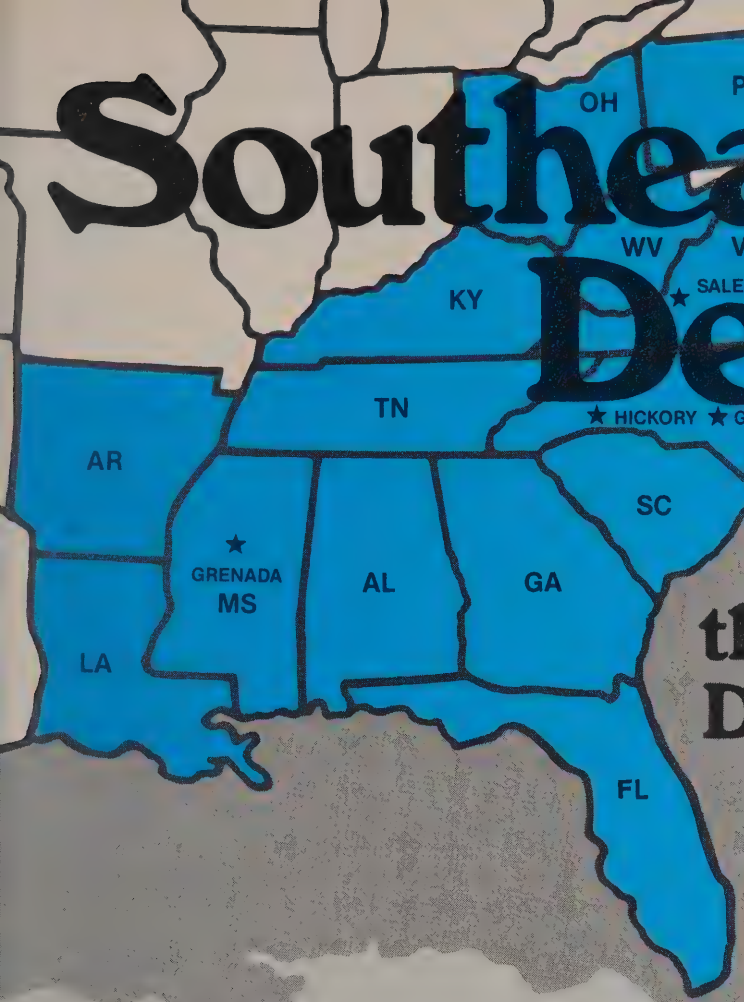

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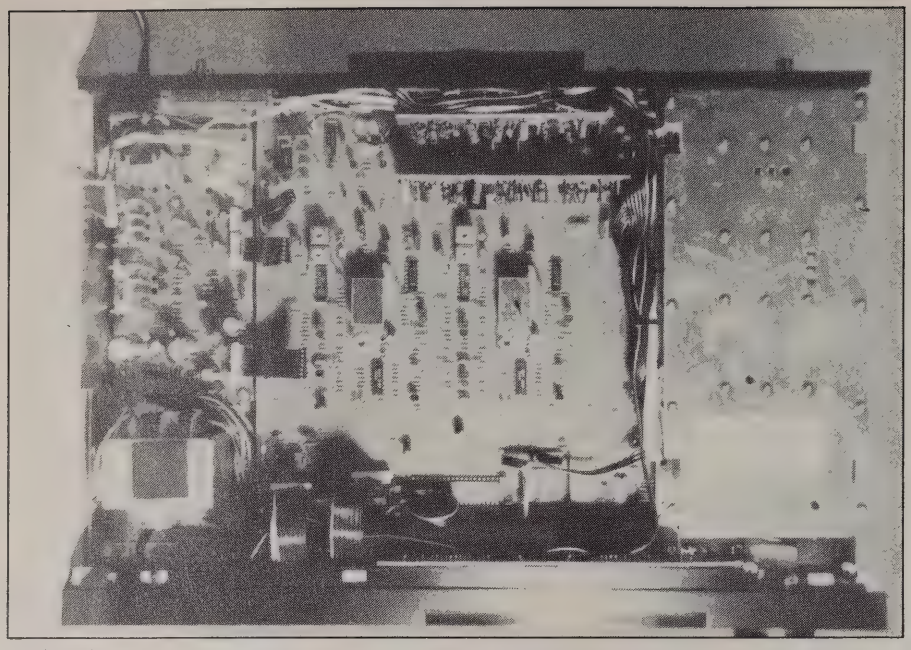
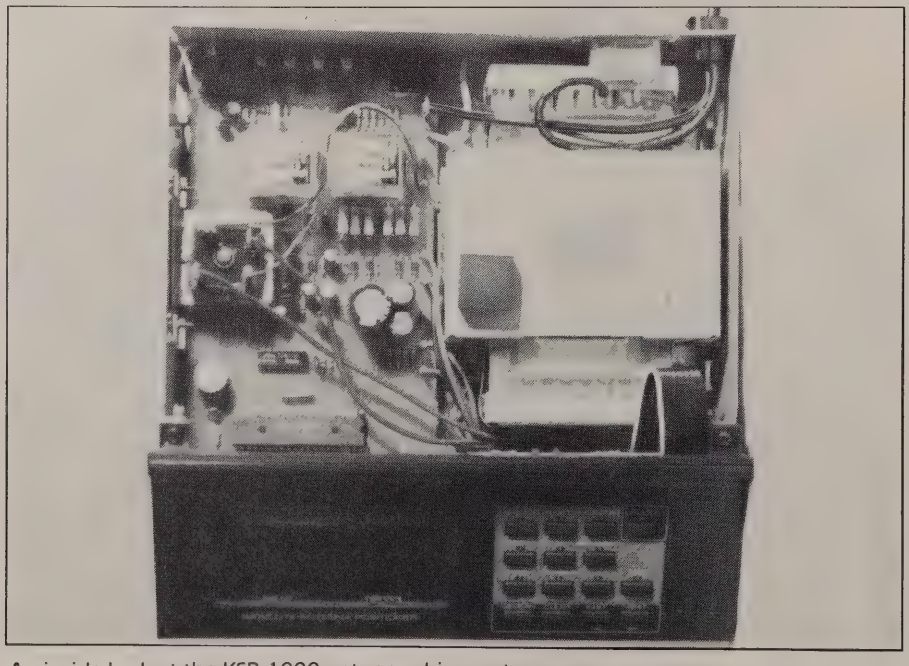


An interior view of the KSR-1000

attached to a hard switch, it uses an optical coupler system. As you turn the knob, the light beam is interrupted and the channel increases or decreases by one number. Each time the channel is changed there is an audio beep from the system to tell you that the knob has done its job. The control has a nice feel to it and hopefully will be copied by all the other receiver designers.

The rest of the front panel has buttons to select the satellite to be viewed next, change the audio system, fine tune the polarization setting prior to storing the position, activate channel scan, and select parental lock out. This last feature locks out not only the video channel, but also disables the power drive so it can't wander over to some other inviting satellite.

The rear panel of both receiver and drive controller contains all the connections for stereo and monaural audio systems, modulated channel 3 or 4 for a TV set, as well as video connections for a VCR or color monitor. The receiver has a terminal strip for both servo and ferrite types of polarization feedhorns. The power drive has a very civilized crimp style type terminal strip for connecting the power drive cable. The only other connection and control on the rear of the drive controller is for the data cable that runs between the receiver and controller and an AC power circuit breaker button, respectively.



An inside look at the KSP-1000 antenna drive system.

Installation
KSR-1000 Receiver

The low noise block downconverter is installed at the focal point of the antenna on one of the feedhorn polarization systems supported by the Kenwood receiver. In most cases, this will be a Chaparral style electro-mechanical type of feed system. The distance between the antenna and the indoor receiver will determine what type of coaxial cable is used. In my case, the distance was about 150 feet and I used RG59 coaxial cable. The installation manual suggests that RG59 cable be used for distances of 150 feet or less. For longer distances, a better quality cable or line amplifier will have to be used. The IF is connected and the polarization control cable is attached to the appropriate terminal strip, power is applied, and bingo, there is video and audio on the TV system. It is that quick and easy. As the receiver comes from the factory, all of the video channels are preset and the audio channels are programmed into ROM, so there is not much to do after power is applied, except install batteries in the hand-held remote control.

KSP-1000 Antenna Drive System

As is the case with most drive systems, the Kenwood drive controller and actuator is a little more complicated to install than just a receiver by itself. Once you get the actuator attached to your antenna, you are 75 percent of the way through the installation. The Kenwood system does not include any mounting hardware, so you will have to purchase the proper parts for your antenna. The cable required for connecting the actuator to the controller is nothing special, therefore the standard two #18 DC wires and three #20 sensor and ground wires will do the trick. The cable is attached to the terminal strips at both the controller and actuator. Except for being sure the actuator moves in the right direction when the "east or west" button is pushed, you are ready to go.

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Before programming any satellite positions in the controller, you must set the east and west electronic limits. The procedure is simple. After pushing the "east" and "clear" buttons, run the drive to the east limit position and press the "memory" button. The east limit is now set. The west limit is set in much the same way. Once that is done, you are ready to search the satellite arc for up to 19 satellites (that is how many memory positions the controller has). After you have programmed in all the satellites of interest, be sure to go back and set the mechanical limit on the actuator. The Kenwood actuator is made by Hammerblow and has adjustable tube extension limit switches—use them!

The best way to program a combination receiver-drive system, such as the Kenwood system, is to start at one end of the satellite arc, put the receiver into scan mode and slowly move the drive looking for any signs of life on the TV set. Once video is found, having your trusty satellite guide at your side will help in identifying which satellite you have captured. Be sure to release the satellite after you are done with it, other people are waiting to use it! Only kidding, a little humor there, sorry...yes, back to work.

Besides programming the satellite position, you also set in the polarization position using the "skew" buttons on the receiver. When you are ready, assign the correct satellite name to your newly captured satellite and press the memory button and you are done. I found the manual to be a little skimpy here, so be sure to read the instructions very carefully and you should have no problem getting the job done correctly.

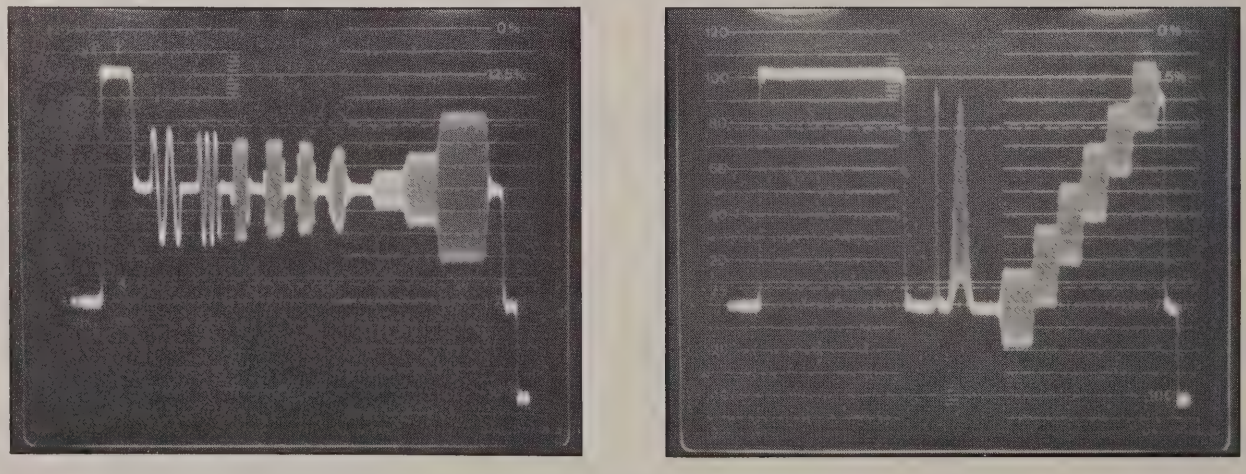
> I had hoped that Kenwood, being an audio equipment manufacturer, would insure that the stereo section would perform well—boy, did it ever.

Operation and Subjective Evaluation

Once the programming of the receiver and drive was completed, which I might add took no longer to do than it took to tell you about it, I was ready to sit back in my easy chair with the fatman control and wander from satellite to satellite. The system was, without a doubt, the simplest to operate combination system I have played with recently. The drive never missed its intended target, the polarization was always set in correctly by the memory programming, and the correct audio channel also came up. I didn't have to do a thing—truly a lazy man's dream.

The wide IF bandwidth of 27 MHz and low video threshold provide excellent video quality on even a 6 foot antenna. I had hoped that Kenwood, being an audio equipment manufacturer, would insure that the stereo section would perform well—boy, did it ever. The audio distortion was about as low as it can be, considering we are dealing with a satellite link, and the signal-to-noise ratio was equally good. The wide and narrow audio bandwidths came in real handy as I went from standard to wide audio formats, such as MTV or the very narrow FM subcarriers often found on many transponders. There is a separate stereo level control on the front panel that allows you to balance the audio level going into your stereo system. This level control does not affect the two monaural outputs used by the VCR or color monitor.

Operationally, the only feature that did not seem to work as well as I would have liked was the signal strength meter. It didn't seem to be as sensitive as it should have been. I did adjust the rear panel control, but I still felt that I could do a better job of fine tuning the antenna by watching the video picture rather than watching the meter. You must use the receiver controls for mov-



Typical frequency responses of the KSR-1000.

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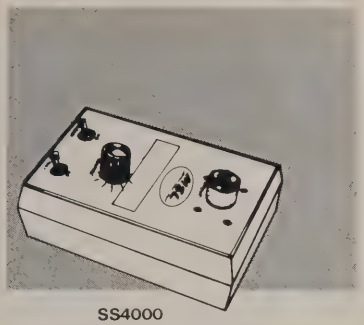
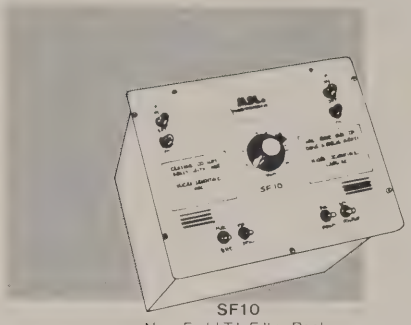
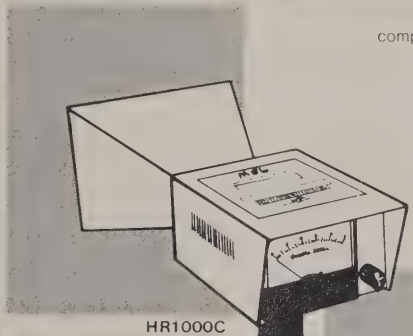


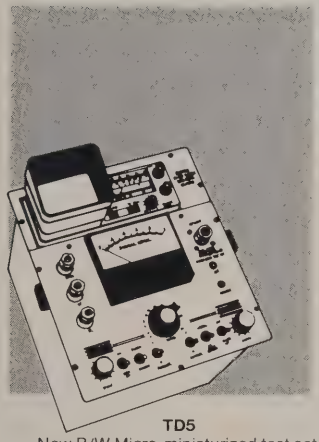
SS4000
Satellite Signal Simulator; pocket sized with color bar signal generator.



SF10
New Field T.I. Filter Pack; completely switchable filter package in rugged steel case.



HR1000C
T.I. Detector Gun; compact, portable; detect T.I. at the site survey to save time and money.



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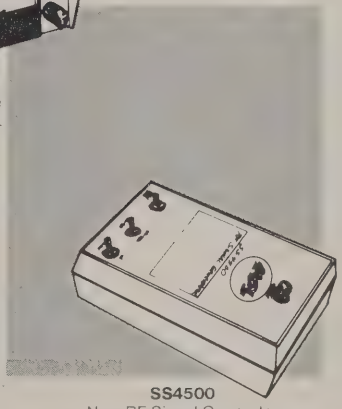

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ing the actuator since that is the only way the polarization system can work. If you do happen to press the drive controller buttons to move to a new satellite, the drive will work, but the polarization will not. No big deal, just push the correct buttons on the receiver for that satellite and the polarization will catch up to the drive.

Except for audio level control and direct channel access, the remote control has all the features you need to operate the complete system from across the room. I really like the feel of the main tuning knob and the funny little beep you hear each time you change video channels, very high class!

Changes I Would Like To See In The Kenwood/ Drive System

The list here is very short. At the very top of the list is lack of frequency synthesizer tuning. For such a high class machine, not being synthesized is a glaring deficiency. During the short time I used the receiver, I had one occasion where the tuning got off by one channel. I would like to see an audio level control on the remote control so you can mute and reduce the audio without going to the TV set or stereo system. The instruction manual for both the receiver and drive controller needs to be more complete. All the information is there, it is just not presented very well. For such a feature-heavy system, the manual should spend more time explaining how it all works. Last, and I am sure it was only a problem on my individual unit, the video level out was 1.5 volts peak-to-peak, which is way too hot for most VCRs and video monitors.

Things I Liked About The Kenwood System

Here the list is very long and if you have read the whole article to this point, you can get the idea that I like this system. You are right! The gas discharge display and feather touch tuning knob top my list of items to drool over. The video and audio quality will satisfy both the videophile and audiophile in the crowd. The drive system seems to be well thought out and performs like it should. The use of both electronic limits and mechanical limits will save many a poor antenna installation. This should be standard on all drive systems, but unfortunately it is not. The remote control could be a nightmare to use, considering all the features found on this system. It is not, however, but is a snap to use and understand.

Conclusion

The Kenwood system came as close as any system has come to getting into the excellent column on the performance data sheet. At 87.5%, it is only 1.5% below the excellent category. If the receiver had been synthesized, or the remote control had an audio level control, or the installation manual had been better written...In other words an improvement in any one of these categories would have done the trick. Even so, the Kenwood system scored the highest of any complete system tested to date at the Retailer test laboratories. Hopefully, on future products Kenwood will add one of these features and I will finally have a system that performs in the "excellent" category. Obviously, based on my test of the Kenwood KSR-1000 receiver and KSP-1000 antenna positioner, I can heartily recommend them for your purchase. ◆

RECEIVER TEST DATA
The Kenwood KSR-1000

VIDEO SECTION
Off-air signal-to-noise ratio
(10 Foot Antenna and 100 Degree Kelvin LNA)

Satellite	Transponder	C/N	S/N dB (unweighted)
Satcom F3R	8	10.1dB	39
	11	12.0	41
	21	11.1	40
	22	11.0	39
	19	13.3	41
Galaxy 1	5	14.3	43
	11	14.2	41
	21	15.0	43
		Average S/N	40.9 (dB)

VIDEO FREQUENCY RESPONSE

Frequency (MHz)	dB
0.5	0
1.0	−0.2
2.0	−0.9
3.0	−1.1
3.58	−2.3
4.2	−3.1

IF Noise Bandwidth = 27 MHz
Video Threshold Static = 7.5 dB

AUDIO PERFORMANCE
Audio Distortion = 0.93%
Signal to Noise Ratio = 50dB

FREQUENCY RESPONSE (−6.0 dB)
Low = 30Hz High = 17 KHz

DOWNCONVERTER PERFORMANCE
Type = LNB (IF = 950-1450 MHz)
Local Oscillator Leakage
Minimum = −90 dBm Maximum = −90 dBm

IMAGE REJECTION

Frequency (MHz)	dBc
3720	N/A
3800	
3900	
4000	
4100	
4180	

TEMPERATURE DRIFT
0 degrees F = −500KHz
68 degrees F = set
120 degrees F = +250KHz

Overall Performance Rating **87.5%**

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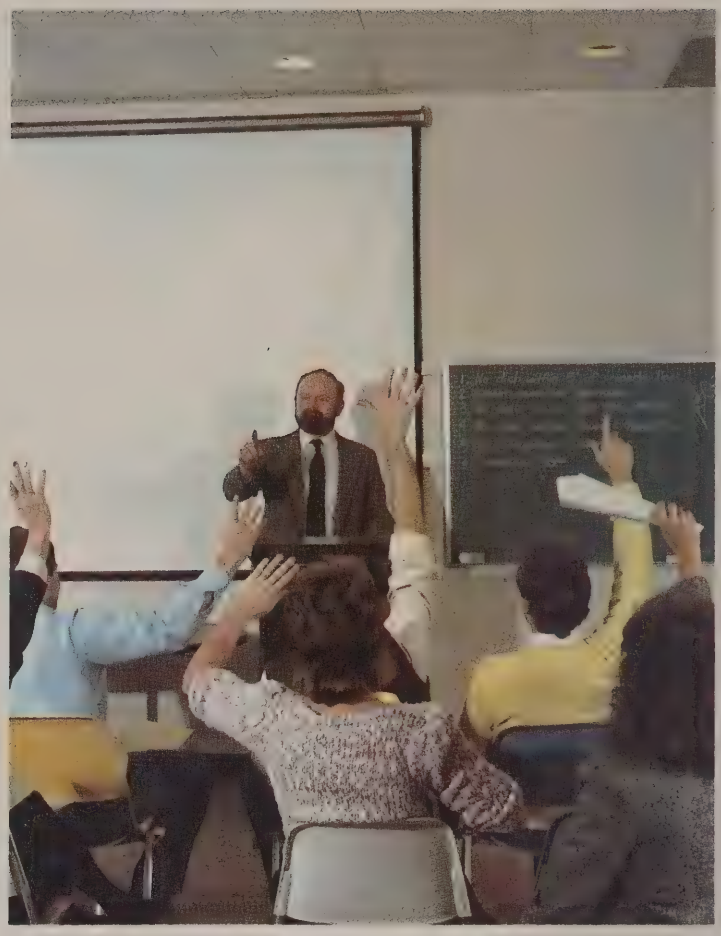


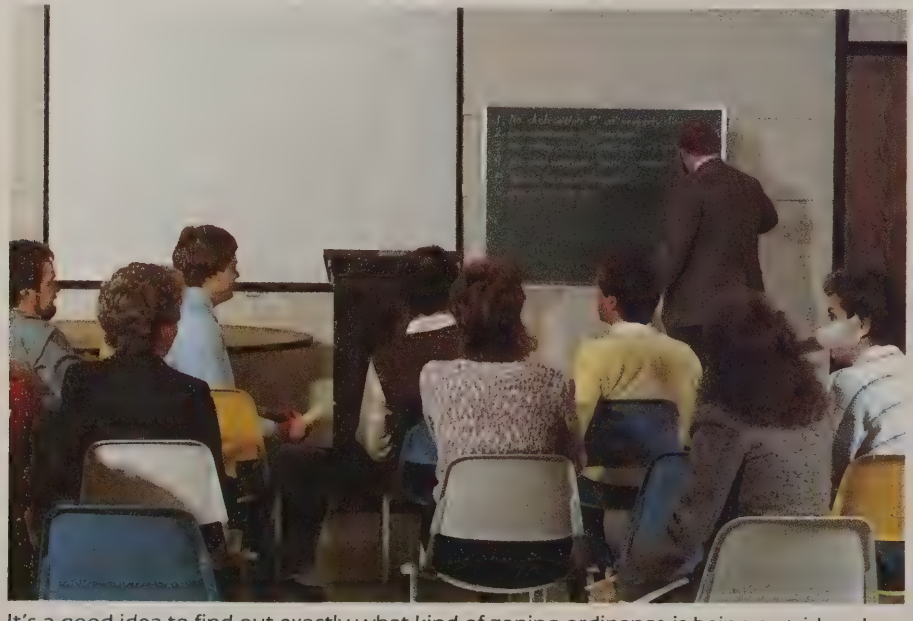
OBSTACLES

Dealer Dilemma

This month, Satellite Retailer introduces a new feature: Dealer Dilemma. Dealers shed light upon some of the problems common to all TVRO dealers.

by Michael Ledbetter

ZONING, LIKE SCRAMBLING, SEEMS to be getting quite a bit of attention these days. And justly so, I might add. It seems that an increasing number of city councils across the country are passing stiff zoning ordinances. These ordinances speak directly to the TVRO owners and are making it difficult, if not impossible, for people to install their satellite systems when and where they want. Most everyone understands that some local governments do need to set regulatory laws regarding home satellite systems. However, some zoning ordinances take the word 'unfair' to the extreme. Let's face it, there is a difference between regulate and ban!



It's a good idea to find out exactly what kind of zoning ordinance is being considered.

This month's Dealer Dilemma centers around Lyndon Massa, a dealer in Sapulpa, Oklahoma. Sapulpa is located about ten miles from Tulsa. I mention Tulsa because a zoning ordinance was passed there which sparked the city council in Sapulpa to consider passing a similar ordinance. Before recounting Lyndon's story, let's briefly review the 'Tulsa Decision.'

It seems that an increasing number of city councils across the country are passing stiff zoning ordinances.

In the summer of 1985, the local government in Tulsa decided to pass an ordinance that would determine where home satellite stations could be placed. What an ordinance it was! If you live in Tulsa and have a TVRO system, it must be installed in your backyard and set back at least one foot from the property line for every foot in height. Depending on the district you live in, you may even have to go as far as two to five feet for every foot of height. In addition, the ground mounted antenna cannot exceed a height of 13 feet. If, for any reason, your system does not (or cannot) comply with the restrictions set forth by the ordinance, you must obtain special approval of the new location by the board of adjustment. After applying for approval of a new site, there is a waiting period of at least 30 days, as well as a non-refundable filing fee of $125. Once you've paid the filing fee and waited at least a month, there is still no guarantee that the request will be approved. In addition, everyone must pay $35 for a building permit. While this is not a detailed description of the Tulsa mandate, you can see that it is a rather demanding ordinance.

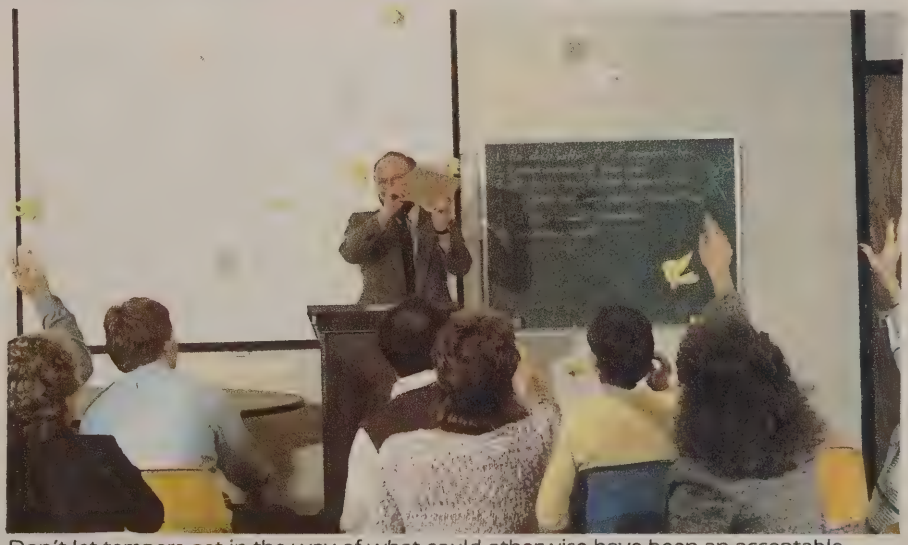
Depending on the district you live in, you may even have to go as far as two to five feet for every foot of height.

Once Tulsa passed its ordinance, Sapulpa felt that it, too, should pass a similar ordinance. In fact, the decree that was to be considered in Sapulpa was almost identical in content to Tulsa's. This is where our friend Lyndon

Once Tulsa passed its ordinance, Sapulpa felt that it, too, should pass a similar ordinance.

Present ideas that you, as a TVRO owner, feel are fair for both sides.

If you feel the proposed ordinance is unfair, stand up and let your voice be heard, but...



Don't let tempers get in the way of what could otherwise have been an acceptable decision.

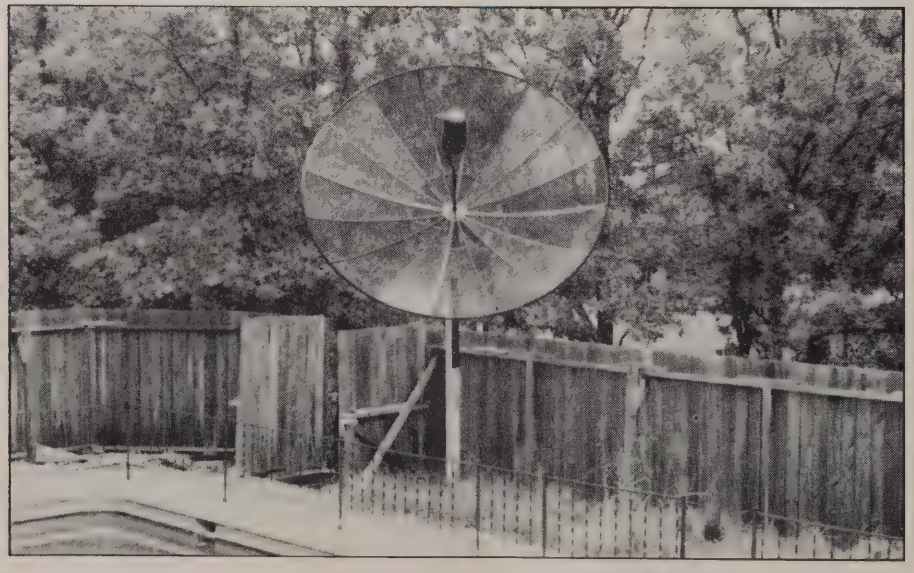
comes into the story. Lyndon has been a dealer in Sapulpa for a little over a year now. It is interesting to note that he opened his business the same day that President Reagan signed the Satellite Viewing Rights Act in 1984. Lyndon is also one of 26 dealers recently certified by SPACE.

When Lyndon heard that the Sapulpa City Council intended to pass a zoning ordinance regulating home satellite systems, he went before the board and asked for a temporary postponement—at least until the matter could be studied more thoroughly. The council complied by assigning three councilmen to study the situation, including Lyndon, who was to serve as technical advisor. In other words, he

▲ Lyndon (left) stands in front of his Tulsa storefront.

▶ One of Lyndon's rural installations. There is no zoning problem here!

▼ The Sapulpa zoning ordinance allows dish owners a great deal of freedom.



was there for any questions that might come up. After studying the matter, the council called for a vote.

It is safe to say that the final decision made many TVRO owners in Sapulpa very happy. The Sapulpa zoning ordinance, as it stands today, states that the dish must be at least 10 feet from the property line and cannot exceed 18 feet from the ground mount. The ordinance also allows 36 feet for a roof mount. You don't have to be a mathematical genius to figure out that this leaves quite a bit of room for satellite owners to play with.

In addition to the technical aspects of the ordinance, there is no waiting period. If you cannot put a dish in your

backyard, the only requirement is that you notify the city inspector and inform him of the alternate position. The fee for this is $5. There's quite a difference between $160 and $5!

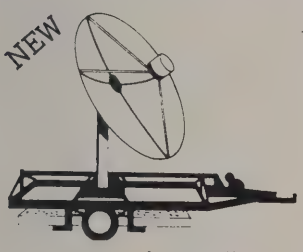
This proves that a zoning ordinance does not have to be ridiculously unfair to be effective.

Essentially, the Sapulpa City Council allowed home satellite owners to write their own ordinance. This proves that a zoning ordinance does not have to be ridiculously unfair to be effective. Lyndon is evidence that it does pay to stand up and work with City Hall as opposed to fighting them. Both Lyndon Massa and the Sapulpa City Council deserve a pat on the back for their admirable efforts.

If you live in a town or city that is in the process of voting in a zoning ordinance regulating satellite systems, find out what you, as an individual, can do to help in the matter. This is not advocating a fight with city hall, but simply suggesting that you work with them. Lyndon showed us what can be done if you work through the proper channels. If nothing else, let this story serve as an inspirational tool for you TVRO owners who find yourselves in the middle of a zoning dispute. Anything is possible if you work at it, or, as in this case, work with it.

In Sapulpa, dishes must be at least 10 feet from the property line

*Dealer Dilemma will become a regular feature in **Satellite Retailer**® Magazine. Dealers who have met and overcome a TVRO dilemma are encouraged to submit their solution to *Retailer* Magazine. Dealers whose letters appear in this column will receive $25.



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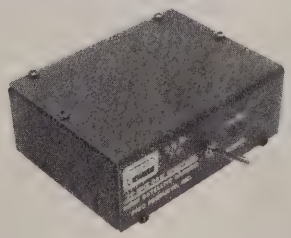

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President

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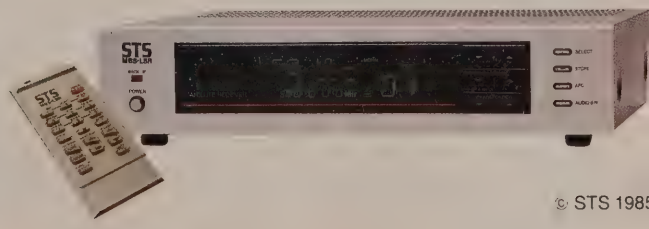

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The Uniden UST 7000 Receiver

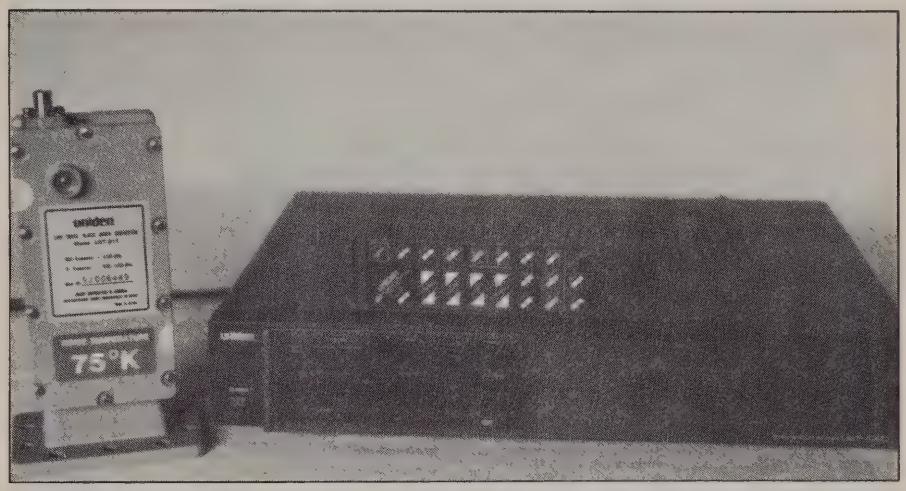
Manufactured in Japan, the UST 7000 is the current top-of-the-line receiver offered by Uniden.

by Mike L. Gustafson

IT HAS BEEN A WHILE SINCE I LAST looked into anything produced by Uniden Corporation of America. The Uniden UST 7000 is the current top-of-the-line satellite receiver offered by Uniden. All of Uniden's products are manufactured in Japan and imported into this country for distribution. The 7000 and the UST 750 power supply make up a complete block downconversion receiver and antenna positioner system. The 7000 comes with a 75 degree Kelvin low noise downconverter, actuator, remote control and power supply. The block system uses the now famous 950 to 1450 MHz intermediate frequency. The 7000 contains stereo demodulators for all of the currently used formats, wide and narrow audio bandwidths, audio noise reduction, and two channels of monaural audio.

Uniden can supply all of the components to make a complete mini-cable system with the 7000 as the main receiver. The 7000 has a microprocessor control system with satellite polarization information pre-programmed into memory. The main video channel tuning is fully synthesized, so channel guessing will not be a problem with the Uniden 7000. The final intermediate frequency is 70 MHz, and is looped out the rear panel, so low cost terrestrial interference filters can be used if necessary.

Half of the front panel is a system status read-out, and the other half is covered with a door. The status display contains the following information: actuator position, current satellite being viewed, current video channel, signal strength meter, stereo format selected, audio bandwidth selected and audio frequencies, both channel A and B. It is arranged in such a manner as to be very easy to see from across the room in bright light. Behind door #3, the door to the right of the status display, you will find the buttons for programming the satellite positions and setting the current time into the clock. Yes, that's right, there is even a clock built into the UST 7000. What will they think of next? Once the receiver has been programmed, the remote control handles most of the features to run the system. The one noteworthy exception is satellite skew. The skew control is found behind the front panel door, and is not on the remote control. Also, polarization skew cannot be programmed into memory.

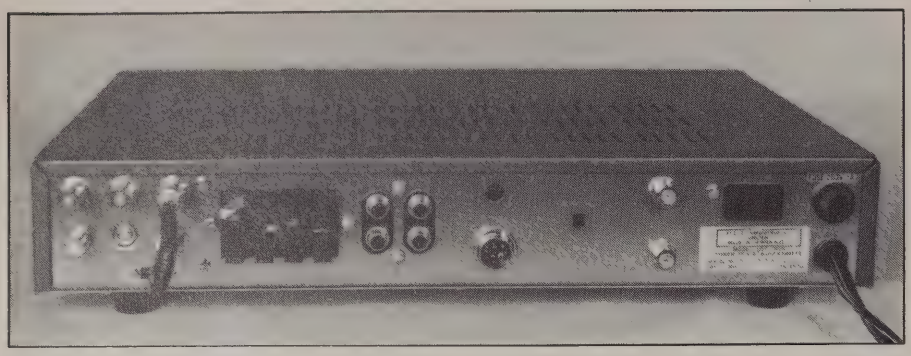


Shown above is the Uniden UST 7000 satellite receiver and the accompanying 75°K low noise block downconverter.

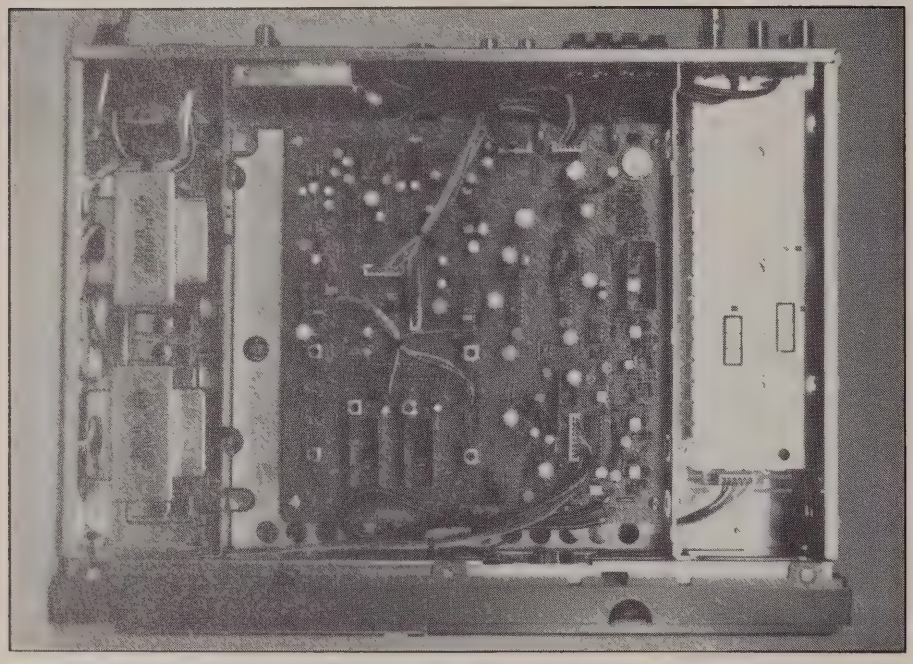
> The 7000 comes with a 75 degree Kelvin low noise downconverter, actuator, remote control, and power supply.

The rear panel is rather standard, with all of the video, stereo, audio, and IF input connections you expect to find on most receivers these days. Other nice features are an extra AC power plug for other equipment, the 70 MHz IF loop through, and a terminal strip for both the polarization control system and V/H switching voltages for the dual downconverter system.

The remote control for the UST 7000 is one of the smallest that I have ever played with, yet it contains numerous control functions. It can, of course, select the satellite to be viewed next; mute the audio, or just run the audio up



Shown here is the rear panel of the UST 7000 receiver.



Inside view of the components of the UST 7000.

or down; tune either of the audio channels; select any of the stereo modes or bandwidths; and manually bump the antenna drive in either direction. The only missing control is satellite polarization skew. Unlike a lot of remote controls, I found this remote to be self-explanatory and simple to understand and use.

Installation

The UST 7000 system comes with all the parts, including the actuator brackets, needed to install the components on an operating antenna. The low noise block downconverter is installed on the feedhorn and the appropriate size IF cable is run between the LNB and the receiver located indoors. The actuator is installed on the antenna using the provided brackets and is connected to the power supply (located near the receiver) using two #14 to #18 gauge cables. There are three other sensor cables that are used to provide the pulse information from the drive to the receiver. The power supply is connected to the receiver with a pre-made cable that comes with the system.

With someone out at the antenna watching it move, push the east or west manual buttons on the receiver and verify that the antenna moves in the correct direction. If not, reverse the two main power cables at the drive or at the power supply, but not at both ends! If the drive does not move at all, it is probably due to no pulses coming from the actuator. The actuator uses an optical pulse generation system, so it should be quite accurate and trouble-free.

If the drive moves in the correct direction, and the IF cable between the LNB and the receiver is connected, we are now ready to program each of the satellite positions into the 7000. The receiver should not be in the 'lock' mode. This mode is indicated by the lock light being lit. If it is, push the lock button for four seconds and the receiver will unlock. Using a satellite guide for identification purposes, push the manual east/west buttons and locate your first satellite to be programmed. Once the satellite is fine tuned with the manual buttons, push the satellite name and number buttons to find the satellite name in the 7000. Then, within four seconds, press the 'memory' button and that satellite position is stored in memory.

> The UST 7000 system comes with all the parts, including the actuator brackets needed to install the components on an operating antenna.

Each satellite name brings along its own polarization format information.

> You will have to be extra careful how the drive is set-up, so that the antenna does not run into the wall of the house or dig a hole to China as it moves across the arc.

As you cycle between the different names, the polarization will also change along with the names. You can program polarization format only, not skew, as you go across the satellite arc. Also, audio information is not programmable as a function of satellite or channel. You continue across the satellite arc programming into memory

each satellite as you stumble across it. For some reason, the Uniden UST 7000 does not have any electronic limits to program into the drive. There are limit switches in the drive itself, but they appear to be set for full retraction and extension, which may or may not be what you need. The manual does not explain how to adjust these limit switches. You will have to be extra careful how the drive is set up, so that the antenna does not run into the wall of the house or dig a hole to China as it moves across the arc.

Once all of the satellites are set in memory, you can lock the system so that no new programming takes place. Just press the lock button and you are done.

Operation and Subjective Evaluation

To recall a stored satellite, do the following: press the satellite name button until the name shows up on the display; then, push the satellite number button, looking for the correct number; finally, within four seconds, push the 'call' button and the drive moves to that location. If you don't press the call button, the old satellite name and number pops back up on the display. Once you are on the satellite of your choice, changing channels is as easy as pushing the up or down button on the remote control. Each time a channel button is pressed, the channel number increments or decrements one channel, and the polarization changes as well. The 7000 does not have direct access, but you can jump across a lot of transponders in a hurry with the two buttons on the remote.

The audio system is controlled in much the same way as the video channel is changed. You can step to either 6.2 or 6.8 MHz audio subcarriers just by pressing a single audio button. If you want some other audio frequency, there are two buttons on the remote that will slowly change the subcarrier frequency for either of the audio channels. The wide or narrow audio bandwidths are selected by pressing the 'narrow' button on the remote. Press it once and the narrow bandwidth is selected; press it again and the wide bandwidth pops up.

If you need to fine tune the dish position, the manual east/west buttons on the remote will let you bump the drive plus or minus ten counts of the actuator. That should be enough to fine tune the antenna position on the satellite, but not enough to run the antenna into anything. Nice touch.

Well, okay, the UST 7000 does what it is supposed to do. All the buttons work and perform needed activities and the remote control is powerful enough for even the most slothful couch potato. But how is the video and audio? The video was very clean and clear when the transmitted channel was on frequency, which was most of the time. But once in a while, I noticed there was some slight tearing on black to white transitions and color drop out occurred. I correlated this with video channels that were not exactly on frequency as transmitted by the uplink. If the 7000 has an AFC on the channel synthesizer, then it is not strong enough or its pulling range is too small. If it doesn't have an AFC, then it needs one.

The audio system was quite good on both wide (MTV) and on narrow audio format systems. I used the stereo format for my background music in the lab for a couple of weeks and can say that the stereo system in the 7000 kept my in-house hi-fi bouncing off the walls. (I like my sound loud. I mean, I want to feel the bass, not just hear it!).

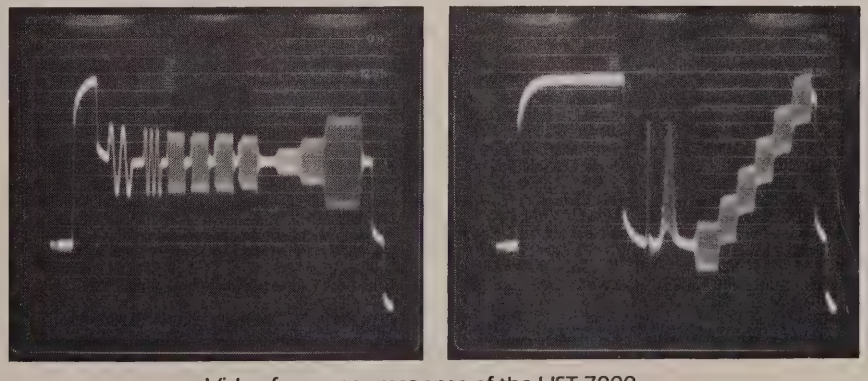
After all was said and done, I found the UST 7000 very easy to use and understand. I do wish I could program satellite skew and audio information as a function of the satellite and channel selected, but you can't have everything. Maybe on the next model?

While I had the 7000 set up on the bench, I fed my Ku-band downconverter into the IF input to see how it would do on Ku-band. I was not able to off-set the tuning enough to really tune in any of the transponders found on SBS-3. The 7000 tried very hard, but no luck.

Once you are on the satellite of your choice, changing channels is as easy as pushing the up or down button on the remote control. Each time a channel button is pressed, the channel number increments or decrements once channel, and the polarization changes as well.

Things I Would Like To See Added or Changed On The UST 7000

The first item that I really want to see on future Uniden products is programmable limits, either electronic or mechanical. Most drive systems do not allow for all of the possible antenna arc geometries, so a limit that is adjustable



Video frequency response of the UST 7000.

is a must. In fact, I downgraded the 7000 on the consumer evaluation chart because of the lack of limits. The next item of need is programmable skew or at least a skew adjustment on the remote control. The video system needs a fine tune control or a better AFC to minimize the tearing I noticed on some channels. During the lab tests, I noted that the 7000 had a lot of low frequency hum in the audio system. The frequency was extremely low and was not audible, but did add to the distortion measurements and audio signal-to-noise ratio. Last, I felt that the manual was just a little too skimpy with information on how to install and operate a receiver possessing all the features found on the 7000. I would like to see the manual expanded to cover a lot more detail in these areas.

Things I Liked About The UST 7000

The 7000 was extremely easy to program and set up with all of the satellite information. The antenna drive uses an optical coupler pulse generation system that, if done properly, should be a superior drive position counting system. The remote control is very simple to use and understand and does not require a ten-page operating manual to keep up with all its functions. The video and audio quality was very good with the exception that the transmitted channel was not exactly on frequency. One nice feature on the 7000 was the emergency stop that can be used on the power drive. Any time the drive is operating and you want it to stop, just press any button on the remote and the drive stops dead. Nice safety item! Video channel selection was quick and sure, and the audio system was equally simple to program.

The installation of the 7000 was extremely simple and Uniden should get high marks for including all the bits and pieces that usually are not provided. The IF splitters and switches make for a simple mini-cable system in your home. Last, the IF bandwidth and low threshold should make the 7000 a good performer on smaller antennas.

RECEIVER TEST DATA
The Uniden UST 7000 Receiver

VIDEO SECTION

Off-air signal-to-noise ratio
(10 Foot Antenna and 100 Degree Kelvin LNA)

Satellite	Transponder	C/N	S/N dB (unweighted)
Satcom F3R	8	10.1	37.0
	11	12.0	41.0
	21	11.1	39.5
	22	11.0	38.0
	23	12.2	40.0
Galaxy 1	5	14.3	40.0
	11	14.2	41.0
	19	15.3	41.0
		Average S/N	39.67 (dB)

VIDEO FREQUENCY RESPONSE

Frequency (MHz)	dB
0.5	0.0
1.0	0.0
2.0	−0.3
3.0	−0.3
3.58	−0.9
4.2	−0.9

AUDIO PERFORMANCE
Audio Distortion = 0.55%
Signal to Noise Ratio = 51.5dB

IF Bandwidth = 25 MHz
Video Threshold Static = 7.0dB

FREQUENCY RESPONSE (−6.0 dB)
Low = 31Hz High = 23 KHz

DOWNCONVERTER PERFORMANCE
Type = LNB DSO
Local Oscillator Leakage:@5150 MHz
Minimum = −64dBm Maximum = −64dBm

IMAGE REJECTION

Frequency(MHz)	dBc
3720	N/A
3800	
3900	
4000	
4100	
4180	

TEMPERATURE DRIFT
0 deg.F = −200KHz
68 deg.F = set
120 deg.F = + 1.4 MHz

Overall Performance Rating — 81%

Conclusion

While the Uniden 7000 is not as versatile as some of the newer microprocessor-controlled systems, it contains enough features and user-friendly points to keep it in the running. The synthesizer tuning is a must these days, and the system used on the 7000 is rock stable. In fact, in some cases it is too good and needs some way of fine tuning the frequency selected to account for slight variances between transponders.

One nice feature on the 7000 was the emergency stop that can be used on the power drive. Any time the drive is operating and you want it to stop, just press any button on the remote and the drive stops dead.

The 7000 is very easy to install and use and should present the first-time installer with a minimum of problems. The audio and video systems provide good quality and most audio or videophiles should have no complaint with the performance of the 7000.

Based on my time spent with the Uniden UST 7000 and the limitations noted, I can recommend it for your consideration. ◆

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   b. Position with company: _____

3. **Subscriber signature:** _____

4. **Date:** _____ **Phone #** ( ) -

5. **Company Name:** _____

   Street _____

   City _____ **State** _____ **Country** _____ **Zip** _____

6. **List three satellite industry magazines you presently receive in order of preference:**

   1) _____

   2) _____

   3) _____

7. **What type of business do you operate?**
   - ☐ Retail Store Front
   - ☐ Distributor
   - ☐ Installation
   - ☐ Part-time Home Business
   - ☐ Manufacturer
   - ☐ Mail Order

8. **If you operate a retail business, what type of products do you handle?**
   - ☐ Complete Satellite TV Systems
   - ☐ Satellite TV Components
   - ☐ TV/Video
   - ☐ HiFi/Stereo

9. **If you are a manufacturer, what products do you manufacture?**
   - ☐ Antennas
   - ☐ Mounts
   - ☐ Feeds
   - ☐ LNA's
   - ☐ Motordrives (actuators)
   - ☐ Motordrive controllers
   - ☐ Receivers
   - ☐ Stereo Processors
   - ☐ Modulators
   - ☐ Other accessories
   - _____
   - _____

10. **Gross Annual Sales of your company:**
    - ☐ $250,000 or less
    - ☐ $250,000 to $500,000
    - ☐ $500,000 to $1,000,000
    - ☐ $1,000,000 to $5,000,000
    - ☐ $5,000,000 or more

11. **How many years have you been in the satellite business?** _____

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Satellite Retailer

1/86

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Please Circle the appropriate response for each question:

1) The nature of your business:
a) manufacturer
b) distributor
c) retailer/owner
d) retailer
e) manufacturer's representative
f) public relations

2) Annual sales volume:
1) under $100,000
2) $100,000 to $499,999
3) $500,000 to $999,999
4) $1,000,000 to $4,999,999
5) $5,000,000 or more

3) Purchasing authority:
a) recommend
b) specify
c) approve

4) This product inquiry is for:
1) immediate purchase
2) future information

5) According to product volume, your primary business is:
a) home satellite systems
b) commercial satellite systems
c) home video equipment sales
d) commercial video sales
e) home electronics & appliances

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1	11	21	31	41	51	61	71	81	91	101	111	121	131	141	151	161	171	181	191	201	211	221	231	241
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3	13	23	33	43	53	63	73	83	93	101	113	123	133	143	153	163	173	183	193	203	213	223	233	243
4	14	24	34	44	54	64	74	84	94	104	114	124	134	144	154	164	174	184	194	204	214	224	234	244
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6	16	26	36	46	56	66	76	86	96	101	116	126	136	146	156	166	176	186	196	206	216	226	236	246
7	17	27	37	47	57	67	77	87	97	107	117	127	137	147	157	167	177	187	197	207	217	227	237	247
8	18	28	38	48	58	68	78	88	98	108	118	128	138	148	158	168	178	188	198	208	218	228	238	248
9	19	29	39	49	59	69	79	89	99	109	119	129	139	149	159	169	179	189	199	209	219	229	239	249
10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240	250

Satellite Retailer

1/86

READER SERVICE CARD

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COMPANY _____ PHONE _____

STREET _____

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Please Circle the appropriate response for each question:

1) The nature of your business:
a) manufacturer
b) distributor
c) retailer/owner
d) retailer
e) manufacturer's representative
f) public relations

2) Annual sales volume:
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5	15	25	35	45	55	65	75	85	95	105	115	125	135	145	155	165	175	185	195	205	215	225	235	245
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9	19	29	39	49	59	69	79	89	99	109	119	129	139	149	159	169	179	189	199	209	219	229	239	249
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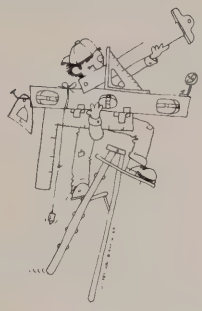

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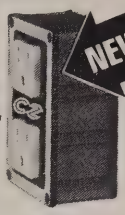

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Calendar

A Calendar of Upcoming Events in the Satellite Television Industry

1986

January

Jan. 8-10, **Integrated Services Digital Network (ISDN) Seminar**—Denver, CO. Topics include: "Future Trends and Markets for Integrated Circuits." Contact: IGI Consulting, Inc., (617) 738-8088.

Jan. 8-10, **Jerrold Technical Seminar**—Los Angeles, CA., Contact: Beth Schaffer, (215) 674-4800.

Jan. 9-10, **ISDN Seminar**—Chicago, IL., Contact: IGI Consulting, Inc., (617) 738-8088

Jan. 9-12, **The 1986 International Winter Consumer Electronics Show**—(Las Vegas, NV). Sponsored by Electronics Industry Association/Consumer Electronics Group. Las Vegas Convention Center and Hilton and Sahara hotels.

Jan 13-14, **ISDN Seminar**—Dearborn, MI., Contact: IGI Consulting, Inc., (617) 738-8088.

Jan. 13-14, **Satellite Communications Show**—Halloran House. New York City. Contact: Marilyn Ellis, (212) 233-1080.

Jan. 15, **HBO/Cinemax**—begins permanent encryption of programming on their G1 and F3R feeds.

Jan. 16-17, **ISDN Seminar**—Toronto, Canada. Contact: IGI Consulting, Inc., (617) 738-8088.

Jan. 21-23, **C-Cor Electronics Technical Seminar** —Oakland Airport Hilton Hotel. Oakland, CA., Contact: Debra Cree, (800) 233-2267.

Jan. 22-23, **Satellite Technology for the Non-Technical Manager**—Orlando, FL., Contact: Phillips Publishing, (301) 340-2100.

Jan. 24-26, **SPACE dealer certification classes**—held via nationwide uplink. (Announced class locations can be found at the end of this colulmn.) Below is a list of classes to be offered.
24th—Antennas for Satellite Reception*
25th—Terrestrial Interference
26th—Troubleshooting the Satellite Reception Industry*
*Required Classes

February

Feb. 13-16, **Howard University Communications Conference.**—Theme: "Communications: The Key to Economic and Political Change." Howard University campus. Information: (202) 636-7491.

Feb. 19-21, **SPACE/STTI Las Vegas Trade Show,** (Las Vegas, NV).

Feb. 19-21, **SPACE dealer certification classes** are held. A list of available classes follows.
19th—The Satellite System (1:00 pm-5:00 pm)
20th—Receiver Design and Technology (9:00 am-1:00 pm)*
21st—Satellite Antenna Installations (9:00 am-1:00 pm)*
*Required Classes

The SPACE dealer certification video downlink will be made available at the following SPACE distributor locations:

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2510 W. Geneva Drive
Tempe, AZ 85282
602/431-0900

CALIFORNIA
Echosphere
5671 Warehouse Way
Sacramento, CA 95826
916/381-5084

Signal Sources
1070 Florence Way
Campbell, CA 95008
408/866-0600

COLORADO
Echosphere
1925 W. Dartmouth
Englewood, CO 80110
303/761-4782

HAWAII
Coconut Wireless
Box 146
Kailua-Kona, HI 96745
808/329-8151

INDIANA
Consumer Satellite Systems
112 Shadowlawn Drive
Noblesville, IN 46060
317/845-4400

NEW HAMPSHIRE
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Raymond, NH 03077
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NEW YORK
Satellite Video Services
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518/678-9581

Satellite Video Services WNY, Inc.
East Avenue Extension
Hornell, NY 14843
607/324-3435

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Satellite Reception Systems
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Athens, OH 45701
614/594-2524

OREGON
SRC Industries
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Wilsonville, OR 97070
503/889-7261

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Indiana, PA 15701
412/349-7180

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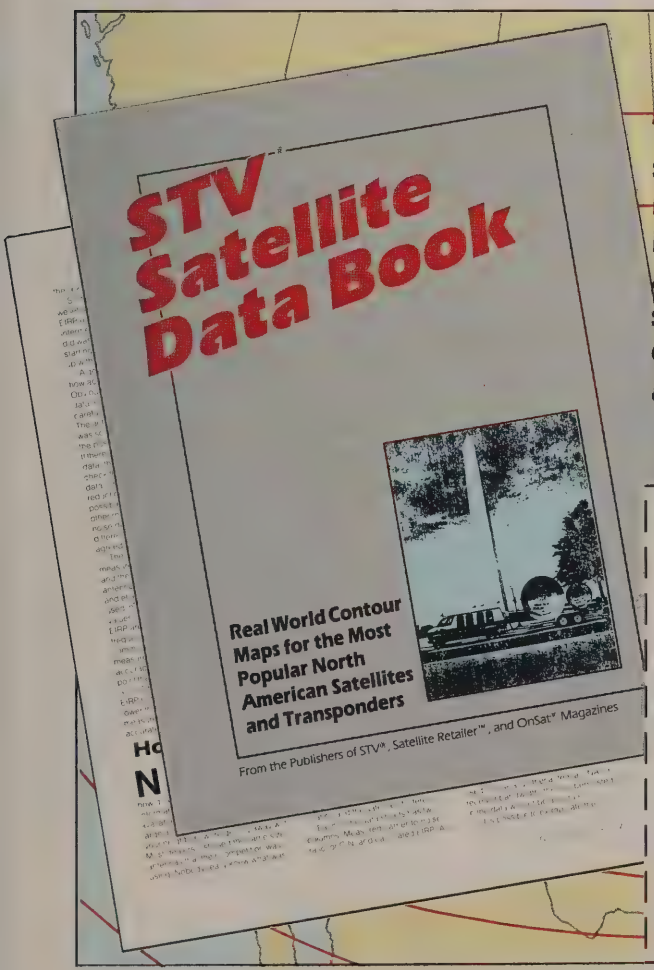
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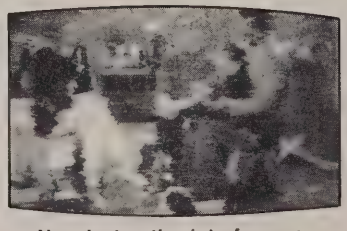
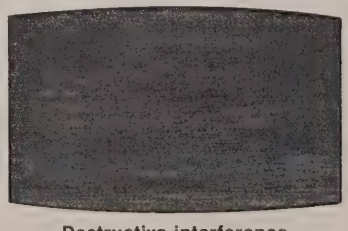


Non-destructive interference
(Can still see some of the picture)



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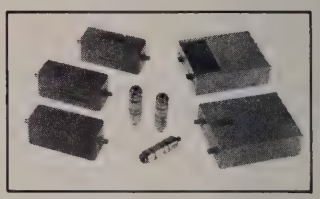
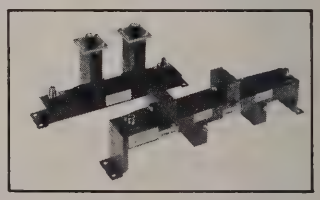


IF filters for non-destructive interference



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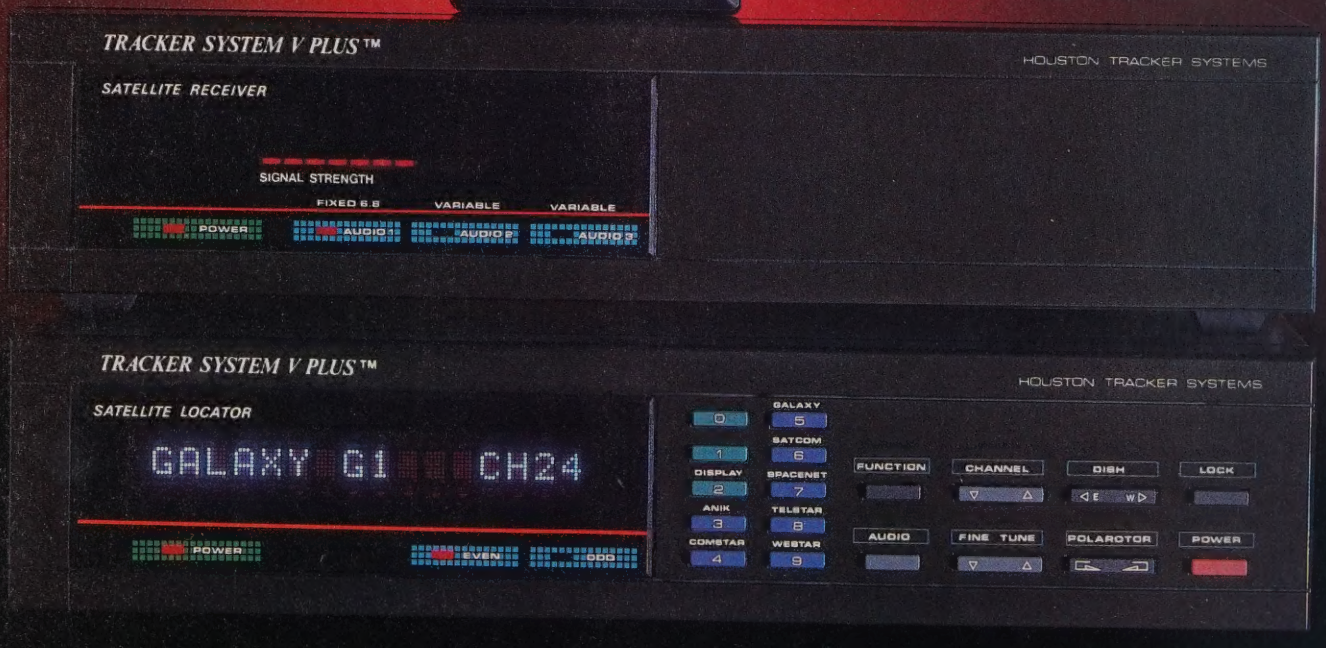

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